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1999 SALMON SPAWNING GROUND SURVEYS

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By:

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ABSTRACT

The numbers of spring and summer chinook salmon *Oncorhynchus tshawytscha* returning to waters within the State of Idaho in 1999 were indexed by counting chinook salmon redds in selected areas and by operating weirs. Surveys of spawner carcasses were also conducted while counting salmon redds. The purposes of the carcass surveys were to estimate length, age and sex composition of annual escapements, and to check for marks and tags. Adults intercepted at weirs were also sexed, measured, and checked for marks and tags.

Counts of spring chinook salmon redds in 1999 significantly decreased from the 1998 numbers through most of the Salmon River drainage. Summer chinook salmon redd numbers also declined. The total number of chinook salmon redds counted in 1999 decreased to 518. The five year average is 672 redds counted during 1994-1998. The 1999 count was extremely low compared to the historical five-year average of 6,891 redds counted during 1957-1966.

Numbers of spring chinook redds counted in the Clearwater River drainage decreased in 1999 compared to the 1998 count of 107. The total number of redds counted in 1999 was 24, compared to a five-year average of 130 counted during 1994-1998.

No adult sockeye salmon *O. nerka* returned to the Redfish Lake Creek weir in 1999.

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INTRODUCTION

Each year chinook *Oncorhynchus tshawytscha* and sockeye *O. nerka* salmon return from the ocean to spawn in Idaho. Snake River spring/summer chinook were listed as Threatened in 1992, and sockeye salmon were listed as Endangered in 1991 under the Endangered Species Act (ESA). Both have declined dramatically in recent years. The ESA listing pertains to native salmon populations in the Salmon River and Snake River tributaries in Oregon and Washington; the reintroduced populations in the Clearwater River are not listed.

Effective management of anadromous salmon requires annual monitoring of the escapement into spawning areas. In Idaho it is especially difficult to enumerate all salmon returning to each of the spawning areas due to the vast geographic area used by these fish and limited access to the spawning habitat. Because quantifying total spawner escapement to each tributary was impractical, the Idaho Department of Fish and Game (Department) developed a program to index annual spawning escapements by enumerating salmon redds in selected areas. The areas surveyed represent a large portion of available chinook salmon spawning habitat, and the number of redds counted in these areas provides an index of the annual spawning escapement. Time-series trends in escapement and production can be assessed from the redd count data. Spawner carcass surveys are conducted while making redd counts to estimate length, age, and sex composition, and to check for marks and tags. Prior to the 1993 release, the adipose fin-clip indicated the fish was marked with a coded-wire-tag (CWT). Since 1993, all Idaho hatchery chinook salmon have had an external mark, regardless of whether they have a CWT.

Chinook salmon redd counts in Idaho were made as early as 1947 (Zimmer 1950, Schoning 1953). However, consistent trend counts date back to 1957. Since 1957, the redd count program was expanded to include additional spawning areas to support expanded monitoring activities and management requirements.

Hassemer (1993a) summarized and critically reviewed the Idaho redd count data for the years 1957-1992. Subsequent annual reports include Elms-Cockrum (1997, 1998, 1999), Elms-Cockrum et al. (1995) and Riley and Elms-Cockrum (1994). In this report, the 1999 redd counts, weir counts, and data on length, age, and sex are made available for trend analysis, management and research use.

OBJECTIVES

To monitor chinook and sockeye salmon spawning escapements in trend areas and to determine sex and age composition of selected runs.

METHODS

Chinook Salmon

Areas where chinook salmon redds are counted have been established on streams in the Salmon River and Clearwater River drainages of Idaho. The purpose of counting redds is to provide an index of annual spawning escapement and identify general trends in spawning escapements. Redd counts are reported for "trend areas", which are important production areas for various stocks and represent a large portion of available spawning habitat. A trend area may be divided into a number of separate transects, each of which is counted. Trend area and transect boundaries generally have remained constant from year to year. Count methods used, and trend area boundary changes made from 1957-1992 are described by Hassemer (1993a).

The Department has developed and implemented standardized procedures for counting chinook salmon redds (Hassemer 1993b). Single peak-count surveys are made over each trend area each year. The surveys are timed to coincide with the period of maximum spawning activity on a particular stream, and each transect is therefore assigned a target count-time window based on historic observations. Redd count observations are made depending on the best visual technique for a particular trend area. Techniques include low-flying fixed-wing aircraft, helicopters, or ground surveys conducted on foot. The consistency and accuracy of redd counts can be maintained over time by following these standard procedures, and variability or bias caused by observer changes and hydrologic events can be minimized.

Chinook salmon redd count trend areas are classified as either wild (not influenced by hatchery-reared fish), natural, or hatchery-influenced. The Salmon River drainage contains five wild spring chinook and five wild summer chinook salmon trend areas. Hatchery-influenced generally indicates a consistent and continuing presence of hatchery juveniles and adults in the stream. The Clearwater River drainage contains non-endemic, reintroduced spring chinook salmon populations. In the Clearwater River drainage, the Selway drainage is classified as natural, and the Lochsa and South Fork Clearwater drainages are classified as hatchery-influenced.

In 1985, additional redd count transects were established in the Salmon River drainage, and categorized as nontraditional trend areas. Data from these transects are excluded from the historic trend area data. Counts from these areas will be used for comparisons in future years. The number of nontraditional trend areas may change in the future as dictated by management and research requirements.

The sex ratio and length-frequency distribution of returning adults are monitored, and marks and tags are recorded, by spawner carcass surveys and weir operations on selected streams. Carcass length-frequency information is used to estimate the age composition of the run. Marked fish are noted in the carcass surveys and electronically scanned for a CWT. When marked fish cannot be scanned on-site, the snouts of all adipose fin-clipped salmon are collected for laboratory processing. Returning adults intercepted at hatchery weirs are also sexed and measured and checked for marks and tags. These weirs are located on the South Fork Salmon River, East Fork Salmon River, Pahsimeroi River, and the upper Salmon River (Sawtooth Hatchery) in the Salmon River drainage, as well as on Red River, Walton Creek (Powell Facility), and Crooked River in the Clearwater River drainage.

Sockeye Salmon

In response to the critical status of the Snake River sockeye salmon, a weir was installed on Redfish Lake Creek in 1991, and all returning sockeye salmon were trapped (1991-1999) for development of a captive broodstock program. Hassemer (1993a) reviews sockeye redd counts made before the species was listed. For further information on the captive broodstock program, refer to Pravacek and Kline (1998).

RESULTS

Salmon River Drainage

Counts of spring chinook salmon redds decreased in 1999 as compared to the 1998 counts. Summer chinook redd counts also declined compared to 1998. The total number of spring and summer chinook salmon redds counted in 1999 for traditional, classified trend areas was 518. Declining from 1,264 redds in 1998, this is a 23% decrease from the previous five-year (1994-1998) average of 672. The 1999 count is only 7.5% of the 1957-1966 average of 6,891(Tables 1-4; Figure 1).

The number of spring chinook salmon redds counted in wild trend areas in 1999 was considerably lower than in 1998. The 53 redds counted were 39% of the 1994-1998 average of 137 (Table 2; Figure 2). Spring chinook redd counts in natural and hatchery-influenced trend areas combined increased slightly from the 1994-1998 average of 67 (Table 1, Figure 2), with 88 redds being counted. No redds were observed in the spring chinook trend area in the upper Yankee Fork Salmon River (Table 1), or in the Marsh Creek drainage and Sulphur Creek trend areas (Table 2).

Counts of summer chinook redds in wild trend areas in 1999 decreased by 35% from the 1994-1998 average of 118 redds, and also demonstrated a 59% decrease from the 1998 count. Counts in natural and hatchery-influenced summer chinook areas combined (300 redds) were a 47% decrease from the 1998 counts (Tables 3 and 4; Figure 3).

A total of 3,405 spring and summer chinook salmon (hatchery and naturally produced) were trapped at hatchery weirs in the Salmon River drainage (Sawtooth, South Fork, Pahsimeroi, and Rapid River) where salmon are passed upstream to spawn naturally (Table 5). East Fork Trap was not operated in 1999 for spring chinook adults.

In general, few redds were counted in nontraditional areas (Table 6) except for an increase in Chamberlain and W. Fk. Chamberlain Creeks. No redds were observed in Sulphur Creek. Counts in most areas remained at levels similar to 1998. Redd counts in unclassified spring/summer chinook spawning areas generally remained at historic low levels with decreases in all areas (Table 7).

Table 1. Numbers of spring chinook salmon redds counted in Salmon River drainage natural (Lemhi River and Upper Valley Creek) and hatchery-influenced trend areas, 1957 -1999. NC = no count.

YEAR	ALTURAS LAKE CREEK[a]	LEMHI RIVER	UPPER EAST FORK[b]	UPPER SALMON RIVER	UPPER VALLEY CREEK	UPPER YANKEE FORK	TOTALS	FIVE YEAR AVERAGE
1999	1	35	23	25	4	0	88	
1998	0	40	33	47	28	4	152	
1997	0	50	3	26	4	0	83	
1996	1	29	5	19	2	0	56	
1995	0	5	1	5	0	0	11	
1994	0	7	3	21	0	0	31	60
1993	6	23	21	65	7	0	122	
1992	2	15	10	51	1	1	80	
1991	3	55	21	83	2	0	164	
1990	0	80	NC	97	3	3	183	
1989	7	32	NC	102	23	7	171	243
1988	1	179	NC	146	12	1	339	
1987	9	155	NC	162	31	0	357	
1986	14	157	NC	134	13	15	333	
1985	7	93	NC	120	1	5	226	
1984	3	35	NC	71	6	NC	115	253
1983	27	46	121	161	8	0	363	
1982	9	149	28	42	1	0	229	
1981	4	115	76	404	2	4	605	
1980	7	25	6	47	6	0	91	
1979	29	146	57	205	25	18	480	1264
1978	303	703	841	1707	141	33	3728	
1977	85	443	168	698	18	6	1418	
1976	16	227	75	378	NC	40	736	
1975	60	365	348	509	189	60	1531	
1974	42	237	346	338	127	54	1144	1482
1973	153	433	665	411	125	104	1891	
1972	143	473	448	748	182	115	2109	
1971	50	392	370	619	89	57	1577	
1970	68	344	468	432	202	67	1581	
1969	41	328	174	313	35	53	944	1905
1968	110	572	622	637	330	234	2505	
1967	74	786	614	943	253	250	2920	
1966	119	738	511	581	219	112	2280	
1965	101	433	138	472	204	77	1425	
1964	80	1038	405	706	199	146	2574	2184
1963	86	364	646	638	141	128	2003	
1962	138	1309	334	638	157	60	2636	
1961	30	1720	618	723	227	192	3510	
1960	33	1262	122	579	87	43	2126	
1959	18	468	75	486	23	10	1080	2067
1958	96	555	141	469	63	38	1362	
1957	110	719	61	1101	219	47	2257	

a Influenced by trapping at Sawtooth Hatchery site beginning 1981.
b Influenced by trapping at East Fork Weir beginning 1984.

Table 2. Numbers of spring chinook salmon redds counted in Salmon River drainage wild trend areas, 1957-1999. NC = no count.

YEAR	BEAR VALLEY CREEK	ELK CREEK	MARSH CREEK DRAINAGE	SULPHUR CREEK	UPPER BIG CREEK	TOTAL	FIVE YEAR AVERAGE
1999	33	10	0	0	10	53	
1998	102	105	90	47	15	359	
1997	38	86	62	15	33	234	
1996	15	17	10	13	1	56	
1995	9	0	0	0	2	11	
1994	10	8	5	0	3	26	175
1993	148	242	120	25	56	591	
1992	41	57	65	5	22	190	
1991	47	54	40	26	13	180	
1990	62	42	57	22	20	203	
1989	15	35	44	2	30	126	386
1988	283	330	217	41	101	972	
1987	102	149	150	11	36	448	
1986	74	55	101	65	67	362	
1985	134	28	108	10	70	350	
1984	55	27	60	0	42	184	231
1983	56	38	33	8	27	162	
1982	39	9	40	3	7	98	
1981	60	23	63	7	22	175	
1980	15	8	9	2	4[a]	38	
1979	69	49	47	15	15	195	311
1978	184	208	270	64	95	821	
1977	129	86	98	5	9	327	
1976	76	61	48	14	22	221	
1975	215	169	201	50	77	712	
1974	130	108	210	30	28	506	754
1973	387	375	518	78	96	1454	
1972	221	212	312	71	60	876	
1971	108	173	281	58	32	652	
1970	334	302	456	93	68	1253	
1969	356	349	222	138	65	1130	1301
1968	574	483	466	142	90	1755	
1967	445	420	650	134	67	1716	
1966	534	525	406	142	123	1730	
1965	301	203	404	32	73	1013	
1964	576	425	709	49	51	1810	1576
1963	460	654	372	140	148	1774	
1962	484	426	341	78	223	1552	
1961	675	581	526	121	377	2280	
1960	386	346	299	39	155	1225	
1959	381	458	88	41	88	1056	1575
1958	312	359	262	131	129	1193	
1957	661	398	458	381	225	2123	

[a] Corrected from NC in Hassemer (1993a).

Table 3. Numbers of summer chinook salmon redds counted in Salmon River drainage wild trend areas, 1957-1999. NC = no count.

YEAR	LOON CREEK	SECESH RIVER LAKE CR.	LOWER SALMON RIVER	LOWER VALLEY CREEK	LOWER EAST FORK	TOTAL	FIVE YEAR AVERAGE
1999	6	38	23	3	7	77	
1998	42	89	29	9	19	188	
1997	22	131	48	8	5	214	
1996	1	67	16	1	5	90	
1995	0/NC[a]	28	6/NC[b]	0	4	38	
1994	1	38	9	9	5	62	130
1993	31	130	48	16	41	266	
1992	22	125	26	6	16	195	
1991	16	112	68	3	23	222	
1990	NC	55	52	9	19	135	
1989	16	78	77	26	51	248	300
1988	5	155	150	33	85	428	
1987	23	121	200	59	62	465	
1986	21	115	104	16	41	297	
1985	28	105	82	1	9	225	
1984	4	xx[c]	51	15	7	77	205
1983	7	98	111	28	27	271	
1982	23	65	39	8	19	154	
1981	30	53	75	17	43	218	
1980	9	20	11	4	0	44	
1979	NC	20	NC	15	33	68	282
1978	29	91	359	219	NC	698	
1977	62	27	94	63	136	382	
1976	31	17	44	43	39	174	
1975	32	10	45	80	38	205	
1974	47	21	40	45	49	202	402
1973	78	62	224	77	138	579	
1972	150	87	412	39	161	849	
1971	79	80	220	147	149	675	
1970	43	63	150	41	123	420	
1969	110	104	120	22	138	494	657
1968	135	58	223	63	235	714	
1967	164	140	365	79	234	982	
1966	49	140	390	184	216	979	
1965	166	134	201	57	131	689	
1964	361	181	415	71	306	1334	1030
1963	261	163	195	50	265	934	
1962	157	281	467	115	195	1215	
1961	131	191	356	158	559	1395	
1960	334	510	811	137	403	2195	
1959	123	240	352	70	240	1025	2058
1958	193	355	460	47	345	1400	
1957	425	328	2533	331	656	4273	

[a] No count for WS-6, from Cabin Creek to Canyon at Falconberry.
[b] No count for NS-22-24, from Lemhi River upstream to U.S. 93 Bridge.
[c] "xx" = count not comparable to other years.

Table 4. Numbers of summer chinook salmon redds counted in Salmon River drainage natural (Johnson Creek) and hatchery-influenced (South Fork Salmon River) trend areas, 1957-1999.

YEAR	JOHNSON CREEK	S. FORK SALMON RIVER	TOTAL	FIVE YEAR AVERAGE
1999	23	277	300	
1998	48	517	565	
1997	94	544	638	
1996	23	159	182	
1995	9	97	106	
1994	20	239	259	478
1993	142	939	1081	
1992	76	685	761	
1991	64	393	457	
1990	56	386	442	
1989	42	217	259	567
1988	137	718	855	
1987	72	752	824	
1986	53	289	342	
1985	75	323	398	
1984	17	165	182	264
1983	63	185	248	
1982	37	111	148	
1981	45	126	171	
1980	24	116	140	
1979	36	115	151	227
1978	113	251	364	
1977	81	226	307	
1976	68	241	309	
1975	69	238	307	
1974	107	218	325	517
1973	271	586	857	
1972	220	567	787	
1971	183	421	604	
1970	130	527	657	
1969	273	636	909	800
1968	127	515	642	
1967	286	902	1188	
1966	110	980	1090	
1965	116	656	772	
1964	310	1124	1434	1301
1963	266	1057	1323	
1962	295	1589	1884	
1961	201	1058	1259	
1960	486	2290	2776	
1959	278	1305	1583	1991
1958	82	1206	1288	
1957	319	2732	3051	

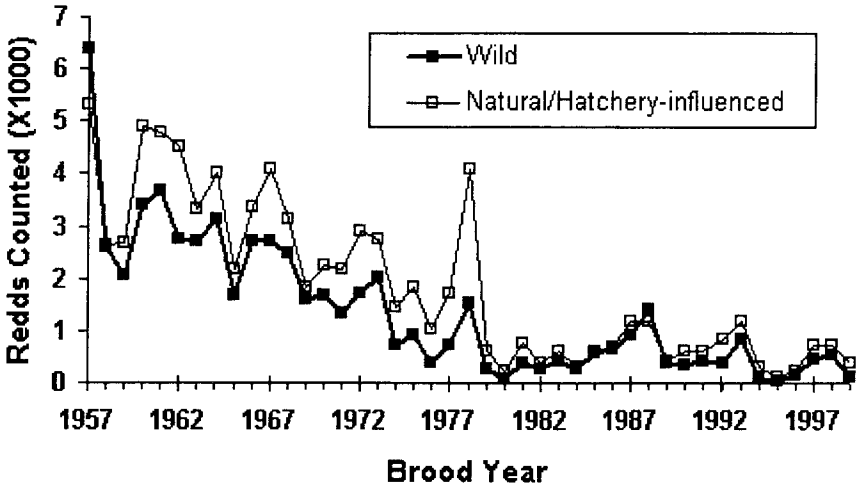

Figure 1. Numbers of combined spring and summer chinook salmon redds counted in Salmon River drainage wild and natural/hatchery-influenced trend areas, 1957-1999. Hatchery influence in spring chinook salmon areas began in 1981, and in 1980 in summer chinook salmon trend areas.

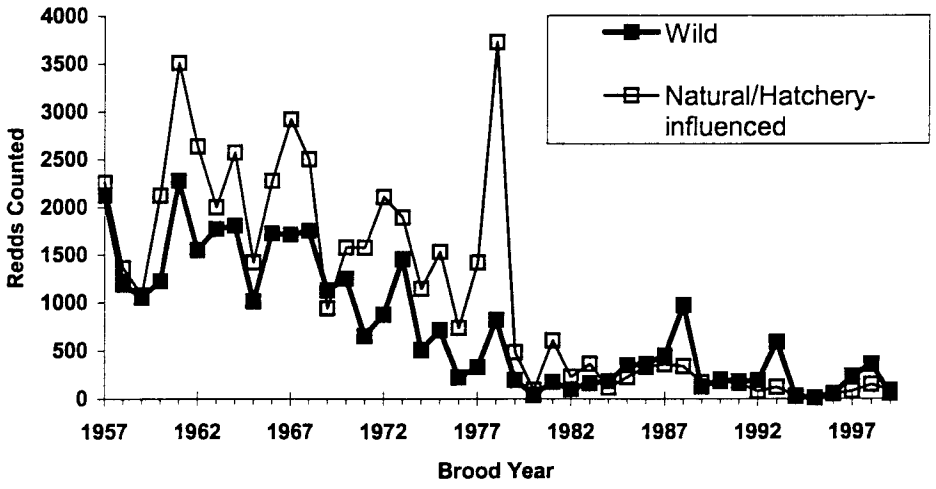

Figure 2. Numbers of spring chinook salmon redds counted in Salmon River drainage wild and natural/hatchery-influenced trend areas, 1957-1999. Hatchery influence began in 1981 at the Sawtooth Hatchery weir and in 1984 at the East Fork Salmon River weir.

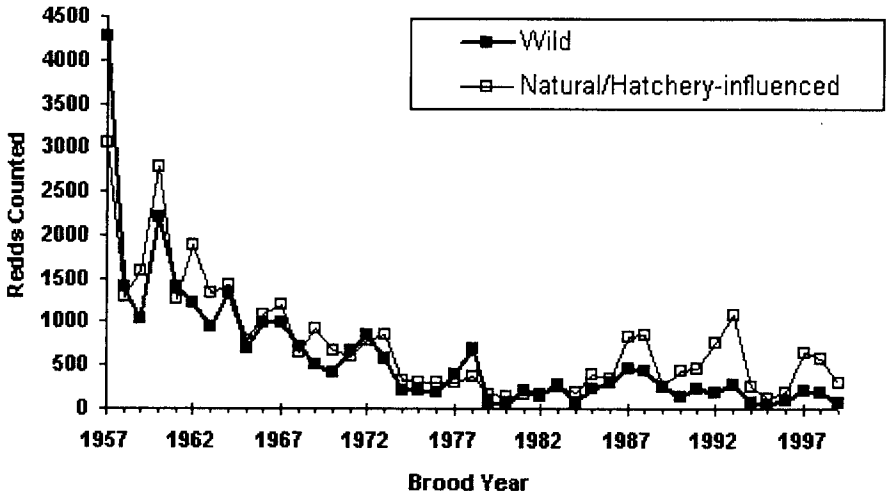

Figure 3. Numbers of summer chinook salmon redds counted in Salmon River drainage wild and natural/hatchery-influenced trend areas, 1957-1999. Hatchery influence began at the South Fork Salmon River weir in 1980.

Table 5. Numbers of adult females, adult males and jack spring and summer chinook salmon trapped at hatchery weirs on the Salmon River drainage from 1995-1999, and the number of salmon released above these weirs to spawn.

Weir	Run	Number trapped				Number released			
		Total	Females	Males	Jacks	Total	Females	Males	Jacks
Sawtooth	Spring Chinook								
1999		196	35	82	79	129	22	54	53
1998		153	77	72	4	92	47	43	2
1997		254	101	144	9	112	43	64	5
1996		156	38	91	27	94	28	58	8
1995		37	4	17	16	20	2	8	10
E. Fk. Salmon	Spring Chinook								
1999[a]									
1998[a]									
1997		7	2	5	0	7	2	5	0
1996		10	2	5	3	10	2	5	3
1995[b]		-	-	-	-	-	-	-	-
S. Fk. Salmon	Summer Chinook								
1999		1961	601	617	743	334	132	165	37
1998		974	498	400	76	314	150	164	-
1997		3659	1598	2061	45	2142	990	1152	-
1996		1199	181	280	738	175	51	89	35
1995		307	99	107	101	85	35	40	10
Pahsimeroi	Summer Chinook								
1999		377	156	132	89	177	64	59	54
1998		127	53	56	18	80	36	33	11
1997		147	63	81	3	72	29	40	3
1996		89	31	49	9	51	13	29	9
1995		80	47	26	7	27	11	11	5
Rapid River[c]	Spring/Summer Chinook								
1999		871	147	84	640	7	1	5	1
1998		1633	937	689	7	42	14	28	0
1997		10773	1843	1494	3	253	133	120	0
1996		1496[d]	362	307	827	58	-	-	26
1995		133[e]	43	65	60	4	0	4	0

[a] E.Fk. Trap not operated for spring chinook adults in 1999 and 1998.
[b] E.Fk. Trap was put into operation late on 7/27/95 due to unusually late snow runoff. No salmon were trapped and none were observed above the trap.
[c] Procedure is to pond hatchery spring chinook and release natural summer chinook. Stock separation based on marks since 1995.
[d] Includes 54 Oxbow Hatchery fish.
[e] Total trapped in 1995 does not include 35 fish from Oxbow which were included in sex composition.

Table 6: Numbers of chinook salmon redds counted in Salmon River drainage non-traditional trend areas, 1990-1999. NC = no count, - = not routinely counted.

Stream	Section	Year									
		90	91	92	93	94	95	96	97	98	99
Upper Salmon River System											
Alturas Lake Creek	Cabin Cr. bridge to diversion dam	0	0	2	0	0	0	0	0	0	0
	Diversion dam to Alturas Lake	2	0	1	0	0	0	0	0	0	0
	Alturas Lake inlet to Alpine Creek	0	0	2	0	1	0	1	0	0	0
Salmon River	Breckenridge diversion dam to mouth of Pole Creek	NC	NC	0	4	0	0	0	0	2	3
	Mouth of Pole Creek to headwaters	NC	NC	0	1	0	0	0	0	0	0
Pole Creek	Mouth to diversion screen	2	0	0	0	0	0	0	0	0	0
	Fish screen to road crossing at upper end of meadow	3	0	0	0	0	0	0	0	0	0
North Fork Salmon River											
N.Fk. Salmon R.	Mouth to Twin Creeks	NC	NC	NC	NC	3	1	-	NC	NC	NC
Middle Fork Salmon River System											
Middle Fork Salmon River	Mouth to mouth of Loon Creek	0	0	0	0	0	NC	1	NC	NC	NC
Sulphur Creek	Ranch upstream to island	18	24	0	36	0	1	4	2	22	0
Main Salmon River Canyon											
Chamberlain Creek	Mouth of West Fork to Flossie Creek	17	NC	17	12	10	4	4	8	2	15
West Fork Chamberlain	Mouth to Game Creek	35	NC	22	8	2	2	3	5	0	7
East Fork Salmon River System											
Herd Creek	Bennett Ranch to mouth of East Pass Cr.	11	2	3	39	3	0	0[c]	14	3[b]	3
East Fork of South Fork Salmon River (EFSF)											
Johnson Creek[d]	Mouth of Boulder Creek to head of canyon	0	12	16	40	1	0	1	5	0	0
Sand Creek	Sand Creek from mouth to bridge	0	0	0	0	0	0	0	0	0	0
EFSF	Yellow Pine to Sugar Creek	-	-	23	19	1	0	0	10	NC	NC
	Profile Creek to Tamarack Creek	-	-	9	14	6	0	0	NC	4	NC
	Profile Creek to Quartz Creek	-	6	NC	0	0	0	0	0	NC	NC
	Tamarack Creek to Salt Creek	-	-	-	21	0	NC	NC	NC	6	NC

[a] Counts in 1988, 1990-95 conducted by Shoshone-Bannock Tribe: Salmon River Habitat Enhancement Project.
[b] Redds counted by Shoshone-Bannock personnel.
[c] Mouth of Whiskey Creek to head of canyon prior to 1993.

Table 7. Numbers of chinook salmon redds counted in Salmon River drainage unclassified trend areas, 1962-1998. Camas Creek is defined as a wild stream and Yankee Fork as a hatchery-influenced system. Ground counting method was used except as indicated (A = air count, G = ground count for years where two methods were used). "NC" indicates transect was not counted.

YEAR	Camas Creek	Lower Yankee Fork[a]	West Fork Yankee Fork[b]
1999	3 (A)	1 (A)	0 (A)
1998	16 (A)	2 (A)	2 (A)
1997	7 (A)	1 (A)	3 (A)
1996	1 (A)	1 (A)	1 (A)
1995	0 (A)[c]	0 (A)	0 (A)
1994	2 (A)	0 (A)	1 (A)
1993	26 (A)	5 (A)	4 (A)
1992	7 (A)	9 (A)	3 (A)
1991	11 (A)	6 (A)	4 (A)
1990	3 (A)	10 (A)	7 (A)
1989	29 (A)	0 (A)	8 (A)
1988	NC	2 (A)	16 (A)
1987	32 (A)	5 (A)	12 (A)
1986	11 (A)	2 (A)	6 (A)
1985	21 (A)	0 (A)	1 (A)
1984	6 (A)	NC	0 (A)
1983	26 (A)	0 (A)	7 (A)
1982	29 (A)	1 (A)	0 (A)
1981	61	16 (A)	19
1980	11	0 (A)	2
1979	13	NC	13
1978	102	27	98
1977	65	12	37
1976	21	5	11
1975	98	35	55
1974	132	28	20
1973	176	71	86
1972	123	78	117
1971	69	41	31
1970	49	79	112
1969	50	44	17
1968	164	97	284
1967	109	65	283
1966	118	132	210
1965	22	63	93
1964	177	54	78
1963	151	92	142
1962	124 (G), 61 (A)	68 (G), 32 (A)	127 (G), 33 (A)

[a] 1962: mouth to Jordan Creek; 1963-78: Pole Flat Forest Camp to Jordan Creek; 1980- 85: Pole Flat Forest Camp to West Fork Yankee Fork; 1986-95: Polecamp Creek to Jordan Creek.

[b] 1960 and 1963-76: mouth to Lightning Creek; 1977-85: mouth to Deadwood Creek; 1961-62 and 86-95: mouth to Cabin Creek.

[c] Camas Creek: WS-8; mouth to Fly Creek = 0 redds, Hammer Creek to Castle Creek = 0 redds.

Length, age and sex composition data are included in Appendix A for spring and summer chinook salmon trapped at the following hatchery weirs: Sawtooth, South Fork, Rapid River, and Pahsimeroi.

Length, age and sex composition data for spring and summer chinook salmon carcasses sampled during spawning ground surveys for the Salmon River drainage are listed in Appendix B.

Redd count maps for the Salmon River drainage are presented in Appendix C.

Clearwater River Drainage

The total number of spring chinook salmon redds counted in natural spawning areas of the Clearwater River drainage during 1999 was 12, 39% of the number counted in 1998, and 67% of the 1994-1998 average of 18 (Table 8, Figure 4). Redd counts in the hatchery-influenced spawning areas in 1999 were considerably lower than 1998 for both the Lochsa and the South Fork Clearwater drainages. The total number of redds counted in the hatchery-influenced areas were only 11% of the 1994-1998 average (Table 9, Figure 5).

Table 8. Numbers of spring chinook salmon redds counted in Clearwater River drainage natural trend areas, 1966-1999. NC = no count.

YEAR	SELWAY RIVER	BEAR CREEK	RUNNING CREEK	WHITECAP CREEK	MOOSE CREEK	TOTALS	FIVE YEAR AVERAGE
1999	5	7	0	0	0	12	
1998	13	11	0	1	6	31	
1997	13	2	0	0	3	18	
1996	10	1	0	0	0	11	
1995	4[a]	2	0	0	4	10	
1994	10	9	0	2	0	21	26
1993	33	13	0	5	10	61	
1992	18	9	0	0	2	29	
1991	12	8	0	1	2	23	
1990	13	6	1	2	2	24	
1989	5	7	0	3	3	18	38
1988	38	10	2	5	7	62	
1987	36	9	4	6	8	63	
1986	30	10	NC	7	9	56	
1985	15	NC	NC	NC	NC	15	
1984	30	6	NC	6	7	49	44
1983	26	8	NC	4	6	44	
1982	38	8	NC	3	5	54	
1981	47	8	NC	4	6	65	
1980	40	7	1	3	4	55	
1979	21	3	0	2	4	30	90
1978	125	13	6	NC	17	161	
1977	97	18	2	1	23	141	
1976	58	14	3	4	15	94	
1975	21	5	NC	1	4	31	
1974	66	10	4	2	15	97	160
1973	261	26	21	7	32	347	
1972	175	25	11	8	13	232	
1971	55	14	8	NC	NC	77	
1970	65	19	10	4	NC	98	
1969	57	6	21	NC	NC	84	63
1968	16	7	4	NC	NC	27	
1967	22	7	NC	NC	NC	29	
1966	36	8	NC	NC	NC	44	

[a] Includes ground count for WC-7, from Magruder Crossing to Little Clearwater River.

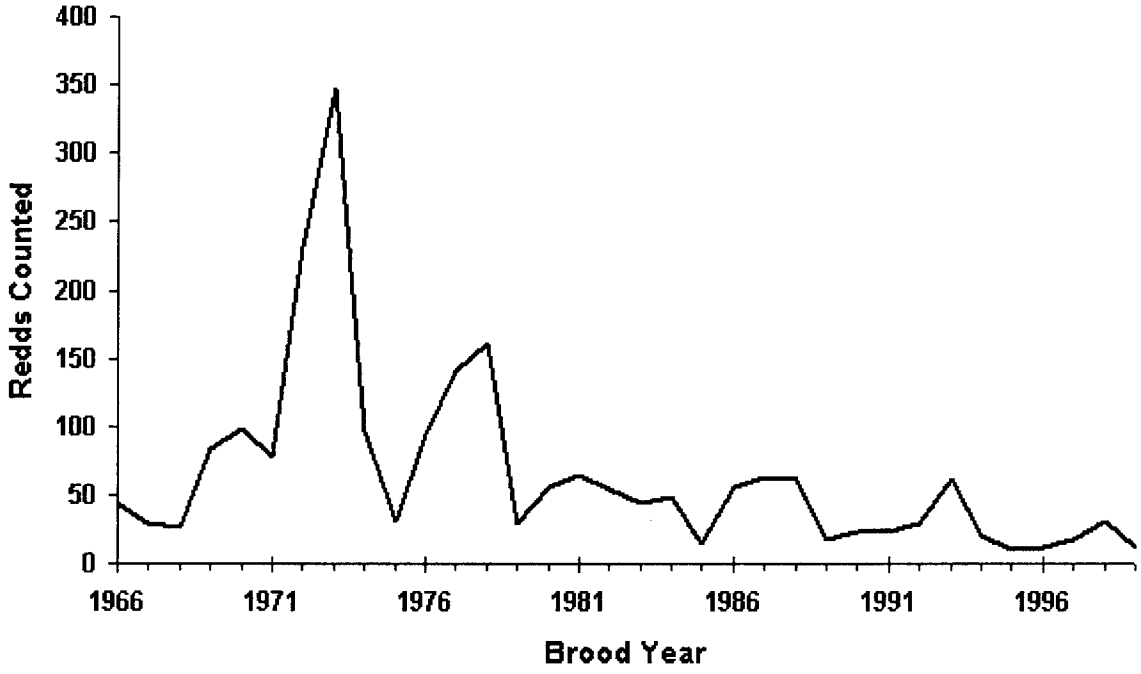

Figure 4. Numbers of spring chinook salmon redds counted in Clearwater River drainage natural trend areas, 1966-1999.

Table 9. Numbers of spring chinook salmon redds counted in Clearwater River drainage hatchery-influenced trend areas, 1967-1999. NC = no count, - = not routinely counted.

YEAR	CROOKED FORK	BRUSHY FORK	LOCHSA RIVER DRAINAGE TOTAL	LOCHSA RIVER DRAINAGE FIVE YR.	NEWSOME CREEK	CROOKED RIVER	RED RIVER	SOUTH FORK AMERICAN RIVER DRAINAGE TOTAL	SOUTH FORK AMERICAN RIVER DRAINAGE FIVE YR.	CLEARWATER RIVER DRAINAGE TOTAL	CLEARWATER RIVER DRAINAGE FIVE YR.
1999	6	0	6		1	1	4	0		12	
1998	16	12	28		10	7	27	4		76	
1997	47	30	77		48	18	95	153		391	
1996	22	0	22		4	5	29	6		66	
1995	1	5	6		0	2	4	0		12	
1994	1	0	1	23	0	4	11	1	64	17	87
1993	34	29	63		64	27	43	75		272	
1992	22	1	23		0	NC	46	1		70	
1991	9	1	10		0	NC	5	1		16	
1990	16	4	20		0	10	66	2		98	
1989	8	9	17	27	4	3	45	1	78	70	105
1988	42	9	51		20	27	51	12		161	
1987	28	10	38		15	17	81	31		182	
1986	30	11	41		6	9	82	14	111	152	
1985	47	14	61		7	10	92	23	132	193	
1984	28	9	37	41	1	22	65	NC	88	125	152
1983	7	6	13		7	12	85	9	113	126	
1982	34	17	51		5	4	82	21	112	163	
1981	27	25	52		7	9	47	12	75	127	
1980	16	10	26		7	6	31	7	51	77	
1979	6	12	18	45	9	4	20	-	33	51	114
1978	37	25	62		22	17	52	-	91	153	
1977	51	15	66		26	21	50	-	97	163	
1976	33	13	46		5	13	15	-	33	79	
1975	22	4	26		6	33	20	-	59	85	
1974	22	6	28	45	-	5	12	-	17	45	66
1973	60	-	60		-	-	-	-	0	60	
1972	32	31	63		-	-	-	-	0	63	

Table 9 continued

YEAR	CROOKED FORK	BRUSHY FORK	LOCHSA RIVER DRAINAGE TOTAL	FIVE YR.	NEWSOME CREEK	CROOKED RIVER	RED RIVER	AMERICAN RIVER	SOUTH FORK DRAINAGE TOTAL	FIVE YR.	CLEARWATER RIVER DRAINAGE TOTAL	FIVE YR.
1971	1	-	1		-	-	-	-	0		1	
1970	34	-	34		-	-	-	-	0		34	
1969	112	-	112	32	-	-	-	-	0	0	112	32
1968	15	-	15		-	-	-	-	0		15	
1967	0	-	0		-	-	-	-	0		0	

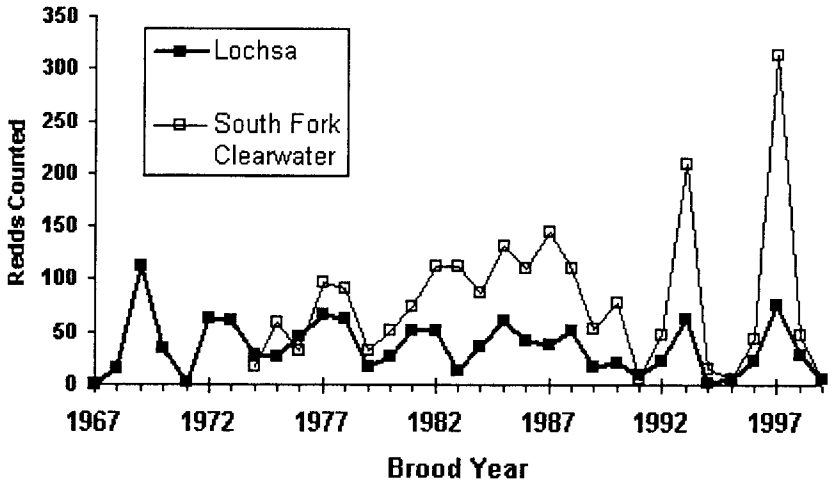

Figure 5. Numbers of spring chinook salmon redds counted in Clearwater River drainage hatchery-influenced trend areas, 1968-1999.

The total number of redds counted in the nontraditional trend areas of the Clearwater River drainage during 1999 showed another decline. The number of redds decreased from 21 in 1998 to 5 in 1999 (Table 10).

Numbers of spring chinook salmon trapped at hatchery weirs in the Clearwater River drainage (Red River, Powell, Crooked River, and Kooskia NFH) totalled 501 (Table 11).

Length, age and sex composition data for spring chinook salmon intercepted at the Red River, Crooked River, and Powell (Walton Creek) weirs are listed in Appendix A. The Red River and Crooked River length frequency information will be listed as the S.Fk. Clearwater River stock in future reports.

Length, age and sex composition data for spring chinook salmon carcasses sampled during spawning ground surveys for the Clearwater River drainage are listed in Appendix B.

Redd count maps for the Clearwater River drainage are presented in Appendix C. Redd counts conducted for purposes other than Department standard surveys in the Clearwater drainage are identified in Table 12.

Sockeye Salmon

The Redfish Lake Creek adult trap was operated from July 15 to October 13, 1999 with no adults being trapped (personal communication with Paul Kline, 11/22/00)

Table 10. Numbers of spring chinook salmon redds counted in Clearwater River drainage nontraditional trend areas, 1989-1999. NC = no count, - = not routinely counted.

Stream	Section	Year										
		1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
S.F. Red River		NC	NC	NC	NC	NC	2	0	0	0	0	NC
Crooked Fork Cr.	Mouth to Brushy Fork	0	-	-	-	-	-	-	-	-	-	-
	Brushy Fk. to Shotgun Cr.	7	-	-	-	-	-	-	-	-	-	-
	Shotgun Cr. to Boulder Cr.	0	-	-	-	-	-	-	-	-	-	-
	Boulder Cr. to Hopeful Cr.	NC	-	-	-	-	-	-	-	-	-	-
	Mouth to Hopeful Creek	-	6	10	32	49	7	4	31	39	9	2
Brushy Fork Cr.	Mouth to Twin Cr.	0	-	-	-	-	-	-	-	-	-	-
	Twin Cr. to Spruce Cr.	6	-	-	-	-	-	-	-	-	-	-
	Mouth to Spruce Creek	-	6	5	9	28	4	6	6	36	12	3
White Sand Creek	Mouth to Big Flat Cr.	NC	0	0	0	4	1	0	1	5	0	0
Lolo Creek	White Cr. bridge to uppermost K-dam	15	27	11	14	-	-	-	NC	NC	NC	NC
Total		28	39	26	55	81	14	10	38	80	21	5

Table 11. Numbers of adult females, adult males and jack spring chinook salmon trapped at hatchery weirs on the Clearwater River drainage in 1992 - 1999, and the number of salmon released above these weirs to spawn.

Weir	Run	Number trapped				Number released			
		Total	Females	Males	Jacks	Total	Females	Males	Jacks
Powell	Spring Chinook								
1999		188	33	31	124	8	2	1	5
1998		541	248	266	1	43	-	-	-
1997		618	311	305	2	115	55	60	[a]
1996		186	70	71	45	5	0	5	0
1995		14	1	1	12	5	0	1	4
1994		86	55	30	1	0	0	0	0
1993		500	242	250	0	40	15	25	0
1992		270	133	131	6	0	0	0	0
Red River	Spring Chinook								
1999		31	-	-	-	24	1	1	22
1998		90	-	-	-	36	-	-	-
1997		280[b]	-	-	-	57	23	34	-
1996		62	14	39	9	17	1	12	4
1995		4	2[c]	0	2	2	1	0	1
1994		31	13	18	0	15	5	10	0
1993		139	65	73	1	91	42	49	0
1992		39	16	18	5	26	10	12	4
Crooked River	Spring Chinook								
1999		125	-	-	-	55	1	1	53
1998		277	-	-	-	79	-	-	-
1997		1034[b]	-	-	-	126	74	52	-
1996		299	94	113	92	63	20	31	12
1995		6	0	0	6	0	0	0	0
1994		26	18	0	0	11	6	5[d]	0
1993		402	211[e]	185	6	152	75	77	0
1992		228	94	121	13	206	86	110	10
Kooskia NFH	Spring Chinook								
1999		157			72				
1998		408	-	-	1	27	-	-	1
1997		1657[f]	-	-	7	534[f]	284	192	6
1996		202[g]	65	41	86	32	N/A	N/A	N/A
1995		40	8	11	21	0	0	0	0
1994		232[h]	111	89	1	25	N/A	N/A	N/A
1993		1180[i]	565	498	9	91	N/A	N/A	N/A
1992		312[j]	N/A	N/A	N/A	0	0	0	0

[a] Number of males released includes adults and jacks combined.
[b] Sex undetermined.
[c] Includes (1) one-ocean ad clipped female which was released above the weir.
[d] Five adult males were spawned prior to release.
[e] Includes (1) one-ocean female.
[f] Sex undetermined. Total number released includes 52 fish with undetermined sex.
[g] Includes (10) sex unknown.
[h] Includes (31) sex unknown.
[i] Includes (108) sex unknown.
[j] Sex undetermined.

Table 12 . Redd counts conducted for purposes other than Idaho Department of Fish and Game standard redd count information, 1999.

Agency/Tribe	Study	Drainage	Stream
Idaho Dept. Fish and Game	ISS[a]	Clearwater River	Red River
	ISS		American River
	ISS		S. Fk. Clearwater River
	ISS		Ten Mile Creek
	ISS		Johns Creek
	ISS		Big Flat Creek
	ISS		Whitesand Creek
	ISS		Spruce Creek
	ISS		Crooked Fork Creek
	ISS		Brushy Fork Creek
	ISS	Salmon River	Pahsimeroi River
	ISS		Lemhi River
	ISS		N. Fk. Salmon River
	ISM[b]		Alturas Lake Creek
	ISM		Upper Salmon River
	ISM		Frenchman Creek
	ISM		Smiley Creek
Nez Perce Tribe	UCS[c]	Salmon River	Salmon River
	ISS		Slate Creek
	LSRCP[d]	S.Fk. Salmon River	Johnson Creek
	ISS		Lake Creek
	ISS		Secesh River
	LSRCP		S. Fk. Salmon River
	LSRCP	M.Fk. Salmon River	Big Creek
	UCS	Clearwater River	Clearwater River
	NPTH[e]/ISS		Lolo Creek
	NPTH/ISS		Yoosa Creek
	NPTH/ISS		Eldorado Creek
	NPTH	S.Fk. Clearwater	Meadow Creek
	NPTH		Mill Creek
	NPTH/ISS		Newsome Creek
	UCS		S.Fk. Clearwater River
	UCS	M.Fk. Clearwater	M.Fk. Clearwater River
	NPTH	Selway River	Meadow Creek
	NPTH/UCS		Selway River
	NPTH	Lochsa River	Boulder Creek
	ISS		Papoose Creek
	ISS		Squaw Creek
	NPTH		Warmsprings Creek
Shoshone-Bannock Tribes	ISS	M.Fk. Salmon River	Bear Valley Creek
	ISS	Salmon River	E. Fk. Salmon River
	ISS		Herd Creek
	ISS		Valley Creek
	ISS		W. Fk. Yankee Fork
	SRHE[f]		Yankee Fork Salmon River
U.S. Fish & Wildlife Service	ISS	Clearwater River	Pete King Creek
	ISS		Clear Creek

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APPENDICES

APPENDIX A

Appendix A1. Length frequency and age composition of spring chinook salmon trapped at the Sawtooth Hatchery weir, 1999[a].

Males				Females			
Fork Length (cm)	Total Number Recovered	Percent of Total	Age Class	Fork Length (cm)	Total Number Recovered	Percent of Total	Age Class
40	0	0.0%		40	0	0.0%	
42	0	0.0%		42	0	0.0%	
44	2	1.2%		44	0	0.0%	
46	4	2.5%		46	0	0.0%	
48	7	4.4%	Jacks	48	0	0.0%	
50	12	7.5%	n=79	50	0	0.0%	n=0
52	10	6.2%	49.1%	52	0	0.0%	0.0%
54	11	6.8%		54	0	0.0%	
56	9	5.6%		56	0	0.0%	
58	9	5.6%		58	0	0.0%	
60	9	5.6%		60	0	0.0%	
62	4	2.5%		62	0	0.0%	
64	2	1.2%		64	0	0.0%	
66	2	1.2%		66	0	0.0%	
68	3	1.9%		68	0	0.0%	
70	4	2.5%	Age 4	70	0	0.0%	Age 4
72	7	4.3%	n=57	72	0	0.0%	n=21
74	6	3.7%	35.4%	74	4	11.4%	60.0%
76	12	7.5%		76	5	14.3%	
78	9	5.6%		78	6	17.1%	
80	8	5.0%		80	2	5.8%	
82	6	3.7%		82	4	11.4%	
84	5	3.1%		84	1	2.8%	
86	2	1.2%		86	0	0.0%	
88	6	3.7%		88	0	0.0%	
90	1	.6%		90	1	2.9%	
92	1	.6%	Age 5	92	6	17.1%	Age 5
94	1	.6%	n=25	94	3	8.6%	n=14
96	1	.6%	15.5%	96	2	5.8%	40.0%
98	2	1.2%		98	0	0.0%	
100	3	1.9%		100	1	2.8%	
102	0	0.0%		102	0	0.0%	
104	2	1.2%		104	0	0.0%	
106	0	0.0%		106	0	0.0%	
108	1	.6%		108	0	0.0%	
Total	161				35		

[a] Age break criteria: Sawtooth Hatchery Run Report 1999, IDFG, unpublished.

Appendix A2. Length frequency and age composition of spring chinook salmon trapped at the East Fork River weir, 1999[a].

Males				Females			
Fork Length (cm)	Total Number Recovered	Percent of Total	Age Class	Fork Length (cm)	Total Number Recovered	Percent of Total	Age Class
40	0	0.0%		40	0	0.0%	
42	0	0.0%		42	0	0.0%	
44	0	0.0%		44	0	0.0%	
46	0	0.0%		46	0	0.0%	
48	0	0.0%	Jacks	48	0	0.0%	
50	0	0.0%	n=0	50	0	0.0%	n=0
52	0	0.0%	0.0%	52	0	0.0%	0.0%
54	0	0.0%		54	0	0.0%	
56	0	0.0%		56	0	0.0%	
58	0	0.0%		58	0	0.0%	
60	0	0.0%		60	0	0.0%	
62	0	0.0%		62	0	0.0%	
64	0	0.0%		64	0	0.0%	
66	0	0.0%		66	0	0.0%	
68	0	0.0%		68	0	0.0%	
70	0	0.0%	Age 4	70	0	0.0%	Age 4
72	0	0.0%	n=0	72	0	0.0%	n=0
74	0	0.0%	0.0%	74	0	0.0%	0.0%
76	0	0.0%		76	0	0.0%	
78	0	0.0%		78	0	0.0%	
80	0	0.0%		80	0	0.0%	
82	0	0.0%		82	0	0.0%	
84	0	0.0%		84	0	0.0%	
86	0	0.0%		86	0	0.0%	
88	0	0.0%		88	0	0.0%	
90	0	0.0%		90	0	0.0%	
92	0	0.0%	Age 5	92	0	0.0%	Age 5
94	0	0.0%	n=0	94	0	0.0%	n=0
96	0	0.0%	0.0%	96	0	0.0%	0.0%
98	0	0.0%		98	0	0.0%	
100	0	0.0%		100	0	0.0%	
102	0	0.0%		102	0	0.0%	
104	0	0.0%		104	0	0.0%	
106	0	0.0%		106	0	0.0%	
Total	0				0		

[a] East Fork Trap was not operated for spring chinook adults in 1999.

Appendix A3. Length frequency and age composition of summer chinook salmon trapped at the South Fork Salmon River weir, 1999[a].

Males				Females			
Fork Length (cm)	Total Number Recovered	Percent of Total	Age Class	Fork Length (cm)	Total Number Recovered	Percent of Total	Age Class
40	1	0.2%		40	0	0.0%	
42	2	0.2%		42	0	0.0%	
44	7	0.5%		44	0	0.0%	
46	21	1.5%		46	0	0.0%	
48	34	2.5%	Jacks	48	0	0.0%	
50	55	4.0%	n=743	50	0	0.0%	n=1
52	82	6.0%	54.6%	52	0	0.0%	0.2%
54	120	8.8%		54	0	0.0%	
56	139	10.2%		56	0	0.0%	
58	113	8.3%		58	0	0.0%	
60	97	7.1%		60	0	0.0%	
62	48	3.5%		62	0	0.0%	
64	19	1.4%		64	1	0.2%	
66	5	0.4%		66	0	0.0%	
68	1	0.2%		68	2	0.3%	
70	4	0.3%	Age 4	70	3	0.5%	Age 4
72	10	0.7%	n=454	72	8	1.3%	n=517
74	22	1.6%	33.4%	74	20	3.3%	86.0%
76	24	1.8%		76	38	6.3%	
78	63	4.6%		78	79	13.1%	
80	67	4.9%		80	135	22.5%	
82	75	5.5%		82	104	17.3%	
84	68	5.0%		84	77	12.8%	
86	58	4.3%		86	24	4.0%	
88	62*	4.5%		88	27*	4.5%	
90	13	1.0%		90	6	1.0%	
92	14	1.0%	Age 5	92	13	2.2%	Age 5
94	11	0.8%	n=163	94	29	4.8%	n=83
96	8	0.6%	12.0%	96	20	3.3%	13.8%
98	12	0.9%		98	11	1.8%	
100	22	1.6%		100	3	0.5%	
102	23	1.7%		102	1	0.2%	
104	19	1.4%		104	0	0.0%	
106	15	1.1%		106	0	0.0%	
108	16	1.2%		108	0	0.0%	
110	6	0.4%		110	0	0.0%	
112	3	0.2%		112	0	0.0%	
118	1	0.1%		116	0	0.0%	
Total	1360				601		

[a] Age break criteria: McCall Hatchery Run Report 1999, IDFG, unpublished.
* Includes 22 fish 89cm in length.
* Includes 6 fish 89cm in length.

Appendix A4. Length frequency and age composition of spring and summer chinook salmon trapped at the Rapid River Hatchery weir, 1999[a].

Summers[b]				Springs[c]			
Fork Length (cm)	Total Number Recovered	Percent of Total	Age Class	Fork Length (cm)	Total Number Recovered	Percent of Total	Age Class
<38	0	0.0%		<38	3	0.4%	
38	0	0.0%		38	3	0.4%	
40	0	0.0%		40	7	0.8%	
42	0	0.0%		42	17	2.0%	
44	0	0.0%		44	35	4.0%	
46	0	0.0%		46	97	11.2%	
48	0	0.0%	Jacks	48	141	16.3%	Jacks
50	1	12.5%	n=1	50	138	16.0%	n=626
52	0	0.0%	12.5%	52	121	14.0%	72.5%
54	0	0.0%		54	51	5.9%	
56	0	0.0%		56	8	0.9%	
58	0	0.0%		58	5	0.6%	
60	0	0.0%		60	1	0.1%	
62	0	0.0%		62	3	0.4%	
64	0	0.0%		64	0	0.0%	
66	0	0.0%	Age 4	66	0	0.0%	
68	0	0.0%	n=6	68	4	0.5%	
70	1	0.0%	75.0%	70	10	1.1%	Age 4
72	0	0.0%		72	26	3.0%	n=174
74	0	0.0%		74	29	3.4%	20.2%
76	0	0.0%		76	32	3.7%	
78	2	0.0%		78	37	4.3%	
80	1	0.0%		80	14	1.6%	
82	0	0.0%		82	7	0.8%	
84	2	0.0%		84	11	1.3%	
86	0	0.0%		86	15	1.7%	
88	0	0.0%	Age 5	88	19	2.2%	
90	1	12.5%	n=1	90	9	1.0%	
92	0	0.0%	12.5%	92	5	0.6%	Age 5
94	0	0.0%		94	3	0.4%	n=63
96	0	0.0%		96	9	1.0%	7.3%
98	0	0.0%		98	1	0.1%	
100	0	0.0%		100	2	0.2%	
102	0	0.0%		102	0	0.0%	
104	0	0.0%		104	0	0.0%	
106	0	0.0%		106	0	0.0%	
Total	8				863		

[a] Age break criteria: Rapid River Hatchery Run Report 1999, IDFG, unpublished.
[b] Sex composition: (1) jack, (6) adult males, and (1) female.
[c] Sex composition: (639) jacks, (78) adult males, and (146) females.

Appendix A5. Length frequency and age composition of spring chinook salmon trapped at the Red River/Crooked River weirs (S.Fk. Clearwater Stock), 1999 [ab].

Males				Females			
Fork Length (cm)	Total Number Recovered	Percent of Total	Age Class	Fork Length (cm)	Total Number Recovered	Percent of Total	Age Class
40	2	1.4%		40	0	0.0%	
42	4	2.7%		42	0	0.0%	
44	11	7.4%		44	0	0.0%	
46	19	12.8%		46	0	0.0%	
48	27	18.2%	Jacks	48	0	0.0%	
50	23	15.5%	n=139	50	0	0.0%	n=0
52	20	13.5%	93.9%	52	0	0.0%	0.0%
54	21	14.2%		54	0	0.0%	
56	7	4.7%		56	0	0.0%	
58	5	3.4%		58	0	0.0%	
60	0	0.0%		60	0	0.0%	
62	0	0.0%		62	0	0.0%	
64	1	0.7%		64	0	0.0%	
66	0	0.0%		66	0	0.0%	
68	0	0.0%		68	0	0.0%	
70	0	0.0%	Age 4	70	0	0.0%	Age 4
72	0	0.0%	n=4	72	0	0.0%	n=6
74	0	0.0%	2.7%	74	4	50.0%	75.0%
76	0	0.0%		76	0	0.0%	
78	3	2.0%		78	1	12.5%	
80	0	0.0%		80	1	12.5%	
82	0	0.0%		82	0	0.0%	
84	1	0.7%		84	0	0.0%	
86	0	0.0%		86	0	0.0%	
88	1	0.7%		88	2	25.0%	
90	0	0.0%		90	0	0.0%	
92	0	0.0%	Age 5	92	0	0.0%	Age 5
94	0	0.0%	n=5	94	0	0.0%	n=2
96	2	1.4%	3.4%	96	0	0.0%	25.0%
98	0	0.0%		98	0	0.0%	
100	0	0.0%		100	0	0.0%	
102	0	0.0%		102	0	0.0%	
104	1	0.7%		104	0	0.0%	
106	0	0.0%		106	0	0.0%	
Total	148				8		

[a] Age break criteria: Clearwater Hatchery Run Report 1999 IDFG, unpublished.
[b] A total of (31) fish were trapped at Red River and (125) at Crooked River.

Appendix A6. Length frequency and age composition of spring chinook salmon trapped at the Powell weir, 1999[a].

Males				Females			
Fork Length (cm)	Total Number Recovered	Percent of Total	Age Class	Fork Length (cm)	Total Number Recovered	Percent of Total	Age Class
40	0	0.0%		40	0	0.0%	
42	0	0.0%		42	0	0.0%	
44	0	0.0%		44	0	0.0%	
46	5	3.2%		46	0	0.0%	
48	5	3.2%	Jacks	48	0	0.0%	
50	16	10.3%	n=124	50	0	0.0%	n=0
52	26	16.8%	80.0%	52	0	0.0%	0.0%
54	23	14.8%		54	0	0.0%	
56	22	14.2%		56	0	0.0%	
58	17	11.0%		58	0	0.0%	
60	7	4.5%		60	0	0.0%	
62	3	1.9%		62	0	0.0%	
64	0	0.0%		64	0	0.0%	
66	0	0.0%		66	0	0.0%	
68	0	0.0%		68	0	0.0%	
70	0	0.0%	Age 4	70	1	3.0%	Age 4
72	0	0.0%	n=3	72	2	6.0%	n=8
74	2	1.3%	1.9%	74	0	0.0%	24.0%
76	0	0.0%		76	0	0.0%	
78	0	0.0%		78	1	3.0%	
80	1	0.6%		80	1	3.0%	
82	0	0.0%		82	3	9.0%	
84	0	0.0%		84	1	3.0%	
86	0	0.0%		86	0	0.0%	
88	2	1.3%		88	7	21.2%	
90	2	1.3%		90	6	18.2%	
92	4	2.6%	Age 5	92	5	15.2%	Age 5
94	3	1.9%	n=28	94	4	12.2%	n=25
96	7	4.5%	18.1%	96	1	3.0%	76.0%
98	6	3.9%		98	0	0.0%	
100	2	1.3%		100	0	0.0%	
102	2	1.3%		102	1	3.0%	
104	0	0.0%		104	0	0.0%	
106	0	0.0%		106	0	0.0%	
Total	155				33		

[a] Age break criteria: Clearwater Hatchery Run Report 1999, IDFG, unpublished.

Appendix A7. Length frequency and age composition of summer chinook salmon trapped at the Pahsimeroi Hatchery weir, 1999[a].

Males				Females			
Fork Length (cm)	Total Number Recovered	Percent of Total	Age Class	Fork Length (cm)	Total Number Recovered	Percent of Total	Age Class
34	1	0.5%		34	0	0.0%	
36	0	0.0%		36	0	0.0%	
38	0	0.0%		38	0	0.0%	
40	0	0.0%		40	0	0.0%	
42	1	0.5%		42	0	0.0%	
44	5	2.3%		44	0	0.0%	
46	3	1.3%		46	0	0.0%	
48	4	1.8%	Jacks	48	0	0.0%	
50	13	5.9%	n=86	50	0	0.0%	n=0
52	7	3.2%	38.9%	52	0	0.0%	0.0%
54	10	4.5%		54	0	0.0%	
56	17	7.7%		56	0	0.0%	
58	13	5.9%		58	0	0.0%	
60	12	5.4%		60	0	0.0%	
62	10	4.5%		62	0	0.0%	
64	2	0.9%		64	1	0.6%	
66	2	0.9%		66	0	0.0%	
68	1	0.5%		68	4	2.6%	
70	0	0.0%	Age 4	70	6	3.8%	Age 4
72	2	0.9%	n=104	72	7	4.5%	n=145
74	6	2.7%	47.1%	74	17	11.0%	93.0%
76	15	6.8%		76	19	12.2%	
78	22	10.0%		78	42	26.9%	
80	21	9.5%		80	27	17.3%	
82	23	10.4%		82	22	14.1%	
84	13	5.9%		84	6	3.8%	
86	11	5.0%		86	3	1.9%	
88	1	0.5%		88	2	1.3%	
90	5	2.3%		90	0	0.0%	
92	0	0.0%	Age 5	92	0	0.0%	Age 5
94	0	0.0%	n=31	94	0	0.0%	n=11
96	1	0.5%	14.0%	96	0	0.0%	7.0%
98	0	0.0%		98	0	0.0%	
100	0	0.0%		100	0	0.0%	
102	0	0.0%		102	0	0.0%	
104	0	0.0%		104	0	0.0%	
106	0	0.0%		106	0	0.0%	
108	0	0.0%		108	0	0.0%	
Total	221				156		

[a] Age break criteria: Pahsimeroi Hatchery Run Report 1999, IDFG, unpublished.

APPENDIX B

Appendix B1. Traditional spawning ground survey trend areas where carcass counts were conducted but no carcasses were sampled by Idaho Department of Fish and Game personnel, 1999.

Drainage	Stream
Lochsa River	Brushy Fork
S. Fk. Clearwater River	American River Newsome Creek
Selway River	Selway River Whitecap Creek Bear Creek Moose Creek Running Creek
Salmon River (Upper)	E. Fk. Salmon River Herd Creek Valley Creek
M. Fk. Salmon River	Sulphur Creek Knapp Creek Beaver Creek Capehorn Creek Marsh Creek
S. Fk. Salmon River	Johnson Creek Secesh River

Appendix B2. Length frequency and age composition of spring chinook salmon carcasses recovered from Bear Valley Creek (M. Fk. Salmon River drainage) during spawning ground surveys, 1999. All carcasses were sampled by Idaho Department of Fish and Game personnel.

Males				Females			
Fork Length (cm)	Total Number Recovered	Percent of Total	Age Class	Fork Length (cm)	Total Number Recovered	Percent of Total	Age Class
46	1	50.0%		46	0	0.0%	
48	0	0.0%	Jacks	48	0	0.0%	
58	0	0.0%	n=1	58	0	0.0%	n=0
60	0	0.0%	50.0%	60	0	0.0%	0.0%
62	0	0.0%		62	0	0.0%	
64	0	0.0%		64	0	0.0%	
66	0	0.0%		66	0	0.0%	
68	0	0.0%	Age 4	68	0	0.0%	Age 4
70	0	0.0%	n=0	70	0	0.0%	n=2
72	0	0.0%	0.0%	72	0	0.0%	66.7%
74	0	0.0%		74	1	33.3%	
76	0	0.0%		76	0	0.0%	
78	0	0.0%		78	1	33.3%	
80	0	0.0%		80	0	0.0%	
82	0	0.0%		82	0	0.0%	
84	0	0.0%		84	0	0.0%	
86	0	0.0%		86	0	0.0%	
88	0	0.0%		88	0	0.0%	
90	0	0.0%		90	0	0.0%	
92	0	0.0%	Age 5	92	1	33.3%	Age 5
94	0	0.0%	n=1	94	0	0.0%	n=1
96	0	0.0%	50.0%	96	0	0.0%	33.3%
98	0	0.0%		98	0	0.0%	
100	0	0.0%		100	0	0.0%	
102	0	0.0%		102	0	0.0%	
104	0	0.0%		104	0	0.0%	
106	0	0.0%		106	0	0.0%	
108	0	0.0%		108	0	0.0%	
110	0	0.0%		110	0	0.0%	
112	0	0.0%		112	0	0.0%	
120	1	50.0%		120	0	0.0%	
Total	2				3		

[a] Age break criteria: Kiefer et al. 1992.

Appendix B3. Length frequency and age composition of spring chinook salmon carcasses recovered from Big Creek (M. FK. Salmon River drainage) spawning ground surveys, 1999[a].

Males				Females			
Fork Length (cm)	Total Number Recovered	Percent of Total	Age Class	Fork Length (cm)	Total Number Recovered	Percent of Total	Age Class
48	0	0.0%		48	0	0.0%	
50	0	0.0%		50	0	0.0%	
52	0	0.0%	Jacks	52	0	0.0%	
54	0	0.0%	n=0	54	0	0.0%	n=0
56	0	0.0%	0.0%	56	0	0.0%	0.0%
58	0	0.0%		58	0	0.0%	
60	0	0.0%		60	0	0.0%	
62	0	0.0%		62	0	0.0%	
64	0	0.0%		64	0	0.0%	
66	0	0.0%		66	0	0.0%	
68	0	0.0%	Age 4	68	0	0.0%	Age 4
70	0	0.0%	n=0	70	0	0.0%	n=0
72	0	0.0%	0.0%	72	0	0.0%	0.0%
74	0	0.0%		74	0	0.0%	
76	0	0.0%		76	0	0.0%	
78	0	0.0%		78	0	0.0%	
80	0	0.0%		80	1	100.0%	
82	0	0.0%		82	0	0.0%	
84	0	0.0%		84	0	0.0%	
86	0	0.0%		86	0	0.0%	
88	0	0.0%		88	0	0.0%	
90	0	0.0%		90	0	0.0%	
92	0	0.0%	Age 5	92	0	0.0%	Age 5
94	0	0.0%	n=0	94	0	0.0%	n=1
96	0	0.0%	0.0%	96	0	0.0%	100.0%
98	0	0.0%		98	0	0.0%	
100	0	0.0%		100	0	0.0%	
102	0	0.0%		102	0	0.0%	
104	0	0.0%		104	0	0.0%	
106	0	0.0%		106	0	0.0%	
108	0	0.0%		108	0	0.0%	
110	0	0.0%		110	0	0.0%	
112	0	0.0%		112	0	0.0%	
114	0	0.0%		114	0	0.0%	
116	0	0.0%		116	0	0.0%	
Total	0				1		

[a] Age break criteria: Kiefer et al. 1992.

Appendix B4. Length frequency and age composition of summer chinook salmon carcasses recovered from Elk Creek (M. Fk. Salmon River drainage) during spawning ground surveys, 1999[a].

Males				Females			
Fork Length (cm)	Total Number Recovered	Percent of Total	Age Class	Fork Length (cm)	Total Number Recovered	Percent of Total	Age Class
50	0	0.0%		50	0	0.0%	
58	0	0.0%	Jacks	58	0	0.0%	
60	0	0.0%	n=0	60	0	0.0%	n=0
62	0	0.0%	0.0%	62	0	0.0%	0.0%
64	0	0.0%		64	0	0.0%	
66	0	0.0%		66	0	0.0%	
68	0	0.0%		68	0	0.0%	
70	0	0.0%		70	0	0.0%	
72	0	0.0%		72	0	0.0%	
74	0	0.0%	Age 4	74	0	0.0%	Age 4
76	0	0.0%	n=1	76	0	0.0%	n=1
78	1	100.0%	100.0%	78	0	0.0%	50.0%
80	0	0.0%		80	0	0.0%	
82	0	0.0%		82	0	0.0%	
84	0	0.0%		84	0	0.0%	
86	0	0.0%		86	1	50.0%	
88	0	0.0%		88	0	0.0%	
90	0	0.0%		90	0	0.0%	
92	0	0.0%		92	0	0.0%	
94	0	0.0%		94	0	0.0%	
96	0	0.0%		96	0	0.0%	
98	0	0.0%	Age 5	98	0	0.0%	Age 5
100	0	0.0%	n=0	100	1	50.0%	n=1
102	0	0.0%	0.0%	102	0	0.0%	50.0%
104	0	0.0%		104	0	0.0%	
106	0	0.0%		106	0	0.0%	
108	0	0.0%		108	0	0.0%	
110	0	0.0%		110	0	0.0%	
112	0	0.0%		112	0	0.0%	
Total	1				2		

[a] Age break criteria: Kiefer et al. 1992.

Appendix B5. Length frequency and age composition of spring chinook salmon carcasses recovered from W.Fk. Chamberlain Creek (Salmon River drainage) during spawning ground surveys, 1999[ab].

Males				Females			
Fork Length (cm)	Total Number Recovered	Percent of Total	Age Class	Fork Length (cm)	Total Number Recovered	Percent of Total	Age Class
50	0	0.0%		50	0	0.0%	
58	0	0.0%	Jacks	58	0	0.0%	
60	0	0.0%	n=0	60	0	0.0%	n=0
62	0	0.0%	0.0%	62	0	0.0%	0.0%
64	0	0.0%		64	0	0.0%	
66	0	0.0%		66	0	0.0%	
68	0	0.0%		68	0	0.0%	
70	0	0.0%		70	0	0.0%	
72	0	0.0%		72	0	0.0%	
74	0	0.0%	Age 4	74	0	0.0%	Age 4
76	0	0.0%	n=0	76	0	0.0%	n=0
78	0	0.0%	0.0%	78	0	0.0%	0.0%
80	0	0.0%		80	0	0.0%	
82	0	0.0%		82	0	0.0%	
84	0	0.0%		84	0	0.0%	
86	0	0.0%		86	0	0.0%	
88	0	0.0%		88	0	0.0%	
90	0	0.0%		90	0	0.0%	
92	0	0.0%		92	0	0.0%	
94	0	0.0%		94	0	0.0%	
96	0	0.0%		96	0	0.0%	
98	0	0.0%	Age 5	98	0	0.0%	Age 5
100	0	0.0%	n=0	100	0	0.0%	n=0
102	0	0.0%	0.0%	102	0	0.0%	0.0%
104	0	0.0%		104	0	0.0%	
106	0	0.0%		106	0	0.0%	
108	0	0.0%		108	0	0.0%	
110	0	0.0%		110	0	0.0%	
112	0	0.0%		112	0	0.0%	
Total	0				0[b]		

[a] Age break criteria: Kiefer et al. 1992.
[b] A female was observed but not measured.

Appendix B6. Length frequency and age composition of summer chinook salmon carcasses recovered from S.Fk. Salmon River during spawning ground surveys, 1999[a].

Males				Females			
Fork Length (cm)	Total Number Recovered	Percent of Total	Age Class	Fork Length (cm)	Total Number Recovered	Percent of Total	Age Class
46	1	0.0%		46	0	0.0%	
48	1	0.0%		48	0	0.0%	
50	2	0.0%		50	0	0.0%	
52	10	0.0%		52	0	0.0%	
54	10	0.0%		54	0	0.0%	
56	24	0.0%	Jacks	56	0	0.0%	
58	23	0.0%	n=97	58	0	0.0%	n=2
60	16	0.0%	48.0%	60	0	0.0%	2.1%
62	4	0.0%		62	1	0.0%	
64	3	0.0%		64	0	0.0%	
66	3	0.0%		66	1	0.0%	
68	2	0.0%		68	0	0.0%	
70	1	0.0%		70	2	0.0%	
72	2	0.0%		72	5	0.0%	
74	2	0.0%		74	9	0.0%	
76	7	0.0%	Age 4	76	11	0.0%	Age 4
78	13	0.0%	n=87	78	15	0.0%	n=80
80	16	0.0%	43.1%	80	17	0.0%	84.2%
82	12	0.0%		82	12	0.0%	
84	8	0.0%		84	4	0.0%	
86	13	0.0%		86	2	0.0%	
88	11	0.0%		88	3	0.0%	
90	3	0.0%		90	4	0.0%	
92	3	0.0%	Age 5	92	5	0.0%	Age 5
94	2	0.0%	n=18	94	2	0.0%	n=13
96	2	0.0%	8.9%	96	2	0.0%	13.7%
98	4	0.0%		98	0	0.0%	
100	0	0.0%		100	0	0.0%	
102	1	0.0%		102	0	0.0%	
104	1	0.0%		104	0	0.0%	
106	0	0.0%		106	0	0.0%	
108	1	0.0%		108	0	0.0%	
110	1	0.0%		110	0	0.0%	
Total	202				95		

[a] Age break criteria: Kiefer et al. 1992.
[b] An additional sex unknown, seven male and 2 female carcasses were sampled by IDFG personnel: unmeasured. Two sex unknown carcasses were also sampled: 52cm and 78cm.

Appendix B7. Length frequency and age composition of summer chinook salmon carcasses recovered from Lake Creek (S.Fk. Salmon River drainage) during spawning ground surveys, 1999[a b].

Males				Females			
Fork Length (cm)	Total Number Recovered	Percent of Total	Age Class	Fork Length (cm)	Total Number Recovered	Percent of Total	Age Class
50	1	16.7%		50	0	0.0%	
54	0	0.0%		54	0	0.0%	
56	1	16.7%		56	0	0.0%	
58	0	0.0%	Jacks	58	0	0.0%	
60	0	0.0%	n=2	60	0	0.0%	n=0
62	0	0.0%	33.3%	62	0	0.0%	0.0%
64	0	0.0%		64	0	0.0%	
66	0	0.0%		66	0	0.0%	
68	0	0.0%		68	0	0.0%	
70	0	0.0%		70	0	0.0%	
72	0	0.0%		72	0	0.0%	
74	0	0.0%		74	0	0.0%	
76	1	16.7%	Age 4	76	0	0.0%	Age 4
78	0	0.0%	n=3	78	0	0.0%	n=0
80	1	16.7%	50.0%	80	1	100.0%	100.0%
82	0	0.0%		82	0	0.0%	
84	1	16.7%		84	0	0.0%	
86	0	0.0%		86	0	0.0%	
88	0	0.0%		88	0	0.0%	
90	0	0.0%		90	0	0.0%	
92	1	16.7%		92	0	0.0%	
94	0	0.0%		94	0	0.0%	
96	0	0.0%		96	0	0.0%	
98	0	0.0%	Age 5	98	0	0.0%	Age 5
100	0	0.0%	n=1	100	0	0.0%	n=0
102	0	0.0%	16.7%	102	0	0.0%	0.0%
104	0	0.0%		104	0	0.0%	
106	0	0.0%		106	0	0.0%	
108	0	0.0%		108	0	0.0%	
110	0	0.0%		110	0	0.0%	
112	0	0.0%		112	0	0.0%	
Total	6				1		

[a] Age break criteria: Kiefer et al. 1992.

Appendix B8. Length frequency and age composition of summer chinook salmon carcasses recovered from the Secesh River (S.Fk. Salmon River drainage) during spawning ground surveys, 1999[ab].

Males				Females			
Fork Length (cm)	Total Number Recovered	Percent of Total	Age Class	Fork Length (cm)	Total Number Recovered	Percent of Total	Age Class
54	0	0.0%		54	0	0.0%	
56	0	0.0%		56	0	0.0%	
58	0	0.0%	Jacks	58	0	0.0%	
60	0	0.0%	n=0	60	0	0.0%	n=0
62	0	0.0%	0.0%	62	0	0.0%	0.0%
64	0	0.0%		64	0	0.0%	
66	0	0.0%		66	0	0.0%	
68	0	0.0%		68	0	0.0%	
70	0	0.0%		70	0	0.0%	
72	0	0.0%		72	0	0.0%	
74	0	0.0%		74	0	0.0%	
76	0	0.0%	Age 4	76	0	0.0%	Age 4
78	0	0.0%	n=0	78	0	0.0%	n=0
80	0	0.0%	0.0%	80	0	0.0%	0.0%
82	0	0.0%		82	0	0.0%	
84	0	0.0%		84	0	0.0%	
86	0	0.0%		86	0	0.0%	
88	0	0.0%		88	0	0.0%	
90	0	0.0%		90	0	0.0%	
92	0	0.0%		92	0	0.0%	
94	0	0.0%		94	0	0.0%	
96	0	0.0%	Age 5	96	0	0.0%	Age 5
98	0	0.0%	n=0	98	0	0.0%	n=0
100	0	0.0%	0.0%	100	0	0.0%	0.0%
102	0	0.0%		102	0	0.0%	
104	0	0.0%		104	0	0.0%	
106	0	0.0%		106	0	0.0%	
108	0	0.0%		108	0	0.0%	
110	0	0.0%		110	0	0.0%	
Total	0				0		

[a] Age break criteria: Kiefer et al. 1992
[b] No carcasses were observed during spawning ground surveys.

Appendix B9. Length frequency and age composition of summer chinook salmon carcasses recovered from Johnson Creek (S.Fk. Salmon River drainage) during spawning ground surveys, 1999[ab].

Males				Females			
Fork Length (cm)	Total Number Recovered	Percent of Total	Age Class	Fork Length (cm)	Total Number Recovered	Percent of Total	Age Class
50	0	0.0%		50	0	0.0%	
58	0	0.0%	Jacks	58	0	0.0%	
60	0	0.0%	n=0	60	0	0.0%	n=0
62	0	0.0%	0.0%	62	0	0.0%	0.0%
64	0	0.0%		64	0	0.0%	
66	0	0.0%		66	0	0.0%	
68	0	0.0%		68	0	0.0%	
70	0	0.0%		70	0	0.0%	
72	0	0.0%		72	0	0.0%	
74	0	0.0%	Age 4	74	0	0.0%	Age 4
76	0	0.0%	n=0	76	0	0.0%	n=0
78	0	0.0%	0.0%	78	0	0.0%	0.0%
80	0	0.0%		80	0	0.0%	
82	0	0.0%		82	0	0.0%	
84	0	0.0%		84	0	0.0%	
86	0	0.0%		86	0	0.0%	
88	0	0.0%		88	0	0.0%	
90	0	0.0%		90	0	0.0%	
92	0	0.0%		92	0	0.0%	
94	0	0.0%		94	0	0.0%	
96	0	0.0%		96	0	0.0%	
98	0	0.0%	Age 5	98	0	0.0%	Age 5
100	0	0.0%	n=0	100	0	0.0%	n=0
102	0	0.0%	0.0%	102	0	0.0%	0.0%
104	0	0.0%		104	0	0.0%	
106	0	0.0%		106	0	0.0%	
108	0	0.0%		108	0	0.0%	
110	0	0.0%		110	0	0.0%	
112	0	0.0%		112	0	0.0%	
Total	0				0		

[a] Age break criteria: Kiefer et al. 1992.
[b] No carcasses were observed during spawning ground surveys.

Appendix B10. Length frequency and age composition of spring chinook salmon carcasses recovered from Selway River during spawning ground surveys, 1999[ab].

Males				Females			
Fork Length (cm)	Total Number Recovered	Percent of Total	Age Class	Fork Length (cm)	Total Number Recovered	Percent of Total	Age Class
58	0	0.0%	Jacks	58	0	0.0%	
60	0	0.0%	n=0	60	0	0.0%	n=0
62	0	0.0%	0.0%	62	0	0.0%	0.0%
64	0	0.0%		64	0	0.0%	
66	0	0.0%		66	0	0.0%	
68	0	0.0%	Age 4	68	0	0.0%	Age 4
70	0	0.0%	n=0	70	0	0.0%	n=0
72	0	0.0%	0.0%	72	0	0.0%	0.0%
74	0	0.0%		74	0	0.0%	
76	0	0.0%		76	0	0.0%	
78	0	0.0%		78	0	0.0%	
80	0	0.0%		80	0	0.0%	
82	0	0.0%		82	0	0.0%	
84	0	0.0%		84	0	0.0%	
86	0	0.0%		86	0	0.0%	
88	0	0.0%		88	0	0.0%	
90	0	0.0%		90	0	0.0%	
92	0	0.0%	Age 5	92	0	0.0%	Age 5
94	0	0.0%	n=0	94	0	0.0%	n=0
96	0	0.0%	0.0%	96	0	0.0%	0.0%
98	0	0.0%		98	0	0.0%	
100	0	0.0%		100	0	0.0%	
102	0	0.0%		102	0	0.0%	
104	0	0.0%		104	0	0.0%	
106	0	0.0%		106	0	0.0%	
108	0	0.0%		108	0	0.0%	
110	0	0.0%		110	0	0.0%	
112	0	0.0%		112	0	0.0%	
Total	0				0		

[a] Age break criteria: Kiefer et al. 1992.
[b] No carcasses were observed during spawning ground surveys.

Appendix B11. Length frequency and age composition of spring chinook salmon carcasses recovered from Crooked Fork (Lochsa River drainage) during spawning ground surveys, 1999[a]. All carcasses were sampled by Idaho Department of Fish and Game personnel[b].

Males				Females			
Fork Length (cm)	Total Number Recovered	Percent of Total	Age Class	Fork Length (cm)	Total Number Recovered	Percent of Total	Age Class
58	0	0.0%	Jacks	58	0	0.0%	
60	0	0.0%	n=0	60	0	0.0%	n=0
62	0	0.0%	0.0%	62	0	0.0%	0.0%
64	0	0.0%		64	0	0.0%	
66	0	0.0%		66	0	0.0%	
68	0	0.0%	Age 4	68	0	0.0%	Age 4
70	0	0.0%	n=0	70	0	0.0%	n=0
72	0	0.0%	0.0%	72	0	0.0%	0.0%
74	0	0.0%		74	0	0.0%	
76	0	0.0%		76	0	0.0%	
78	0	0.0%		78	0	0.0%	
80	0	0.0%		80	0	0.0%	
82	0	0.0%		82	0	0.0%	
84	0	0.0%		84	0	0.0%	
86	0	0.0%		86	0	0.0%	
88	0	0.0%		88	0	0.0%	
90	0	0.0%		90	0	0.0%	
92	0	0.0%	Age 5	92	0	0.0%	Age 5
94	0	0.0%	n=0	94	0	0.0%	n=0
96	0	0.0%	0.0%	96	0	0.0%	0.0%
98	0	0.0%		98	0	0.0%	
100	0	0.0%		100	0	0.0%	
102	0	0.0%		102	0	0.0%	
104	0	0.0%		104	0	0.0%	
106	0	0.0%		106	0	0.0%	
108	0	0.0%		108	0	0.0%	
110	0	0.0%		110	0	0.0%	
112	0	0.0%		112	0	0.0%	
Total	0				0		

[a] Age break criteria: Kiefer et al. 1992.
[b] Three carcasses were observed during spawning ground surveys but unmeasured.

Appendix B12. Length frequency and age composition of spring chinook salmon carcasses recovered from Red River (S. Fk. Clearwater River drainage) during spawning ground surveys, 1999. All carcasses were sampled by Idaho Department of Fish and Game personnel.

Males				Females			
Fork Length (cm)	Total Number Recovered	Percent of Total	Age Class	Fork Length (cm)	Total Number Recovered	Percent of Total	Age Class
44	0	0.0%		44	0	0.0%	
58	0	0.0%	Jacks	58	0	0.0%	
60	0	0.0%	n=0	60	0	0.0%	n=0
62	0	0.0%	0.0%	62	0	0.0%	0.0%
64	0	0.0%		64	1	33.3%	
66	0	0.0%		66	0	0.0%	
68	0	0.0%	Age 4	68	0	0.0%	Age 4
70	0	0.0%	n=0	70	0	0.0%	n=3
72	0	0.0%	0.0%	72	1	33.3%	100.0%
74	0	0.0%		74	0	0.0%	
76	0	0.0%		76	1	33.3%	
78	0	0.0%		78	0	0.0%	
80	0	0.0%		80	0	0.0%	
82	0	0.0%		82	0	0.0%	
84	1	100.0%		84	0	0.0	
86	0	0.0%		86	0	0.0%	
88	0	0.0%		88	0	0.0%	
90	0	0.0%		90	0	0.0%	
92	0	0.0%	Age 5	92	0	0.0%	Age 5
94	0	0.0%	n=1	94	0	0.0%	n=0
96	0	0.0%	100.0%	96	0	0.0%	0.0%
98	0	0.0%		98	0	0.0%	
100	0	0.0%		100	0	0.0%	
102	0	0.0%		102	0	0.0%	
104	0	0.0%		104	0	0.0%	
106	0	0.0%		106	0	0.0%	
108	0	0.0%		108	0	0.0%	
110	0	0.0%		110	0	0.0%	
112	0	0.0%		112	0	0.0%	
Total	1				3		

[a] Age break criteria: Kiefer et al. 1992.

Appendix B13. Length frequency and age composition of spring chinook salmon carcasses recovered from Chamberlain Creek (Salmon River drainage) during spawning ground surveys, 1999[ab].

Males				Females			
Fork Length (cm)	Total Number Recovered	Percent of Total	Age Class	Fork Length (cm)	Total Number Recovered	Percent of Total	Age Class
50	0	0.0%		50	0	0.0%	
58	0	0.0%	Jacks	58	0	0.0%	
60	0	0.0%	n=0	60	0	0.0%	n=0
62	0	0.0%	0.0%	62	0	0.0%	0.0%
64	0	0.0%		64	0	0.0%	
66	0	0.0%		66	0	0.0%	
68	0	0.0%		68	0	0.0%	
70	0	0.0%		70	0	0.0%	
72	0	0.0%		72	0	0.0%	
74	0	0.0%	Age 4	74	0	0.0%	Age 4
76	0	0.0%	n=0	76	0	0.0%	n=0
78	0	0.0%	0.0%	78	0	0.0%	0.0%
80	0	0.0%		80	0	0.0%	
82	0	0.0%		82	0	0.0%	
84	0	0.0%		84	0	0.0%	
86	0	0.0%		86	0	0.0%	
88	0	0.0%		88	0	0.0%	
90	0	0.0%		90	0	0.0%	
92	0	0.0%		92	0	0.0%	
94	0	0.0%		94	0	0.0%	
96	0	0.0%		96	0	0.0%	
98	0	0.0%	Age 5	98	0	0.0%	Age 5
100	0	0.0%	n=0	100	0	0.0%	n=0
102	0	0.0%	0.0%	102	0	0.0%	0.0%
104	0	0.0%		104	0	0.0%	
106	0	0.0%		106	0	0.0%	
108	0	0.0%		108	0	0.0%	
110	0	0.0%		110	0	0.0%	
112	0	0.0%		112	0	0.0%	
Total	0				0		

[a] Age break criteria: Kiefer et al. 1992.
[b] Four fish were sampled but not measured due to decomposition: (2) females and (2) sex unknown.

Appendix B14. Length frequency and age composition of summer chinook salmon carcasses recovered from Crooked River (S.Fk. Clearwater River drainage) during spawning ground surveys, 1999[a].

Males				Females			
Fork Length (cm)	Total Number Recovered	Percent of Total	Age Class	Fork Length (cm)	Total Number Recovered	Percent of Total	Age Class
52	2	67.7%		52	0	0.0%	
56	1	33.3%	Jacks	56	0	0.0%	
60	0	0.0%	n=3	60	0	0.0%	n=0
62	0	0.0%	100.0%	62	0	0.0%	0.0%
64	0	0.0%		64	0	0.0%	
66	0	0.0%		66	0	0.0%	
68	0	0.0%		68	0	0.0%	
70	0	0.0%		70	0	0.0%	
72	0	0.0%		72	0	0.0%	
74	0	0.0%	Age 4	74	0	0.0%	Age 4
76	0	0.0%	n=0	76	0	0.0%	n=1
78	0	0.0%	0.0%	78	0	0.0%	100.0%
80	0	0.0%		80	0	0.0%	
82	0	0.0%		82	1	100.0%	
84	0	0.0%		84	0	0.0%	
86	0	0.0%		86	0	0.0%	
88	0	0.0%		88	0	0.0%	
90	0	0.0%		90	0	0.0%	
92	0	0.0%		92	0	0.0%	
94	0	0.0%		94	0	0.0%	
96	0	0.0%		96	0	0.0%	
98	0	0.0%	Age 5	98	0	0.0%	Age 5
100	0	0.0%	n=0	100	0	0.0%	n=0
102	0	0.0%	0.0%	102	0	0.0%	0.0%
104	0	0.0%		104	0	0.0%	
106	0	0.0%		106	0	0.0%	
108	0	0.0%		108	0	0.0%	
110	0	0.0%		110	0	0.0%	
112	0	0.0%		112	0	0.0%	
Total	3				1		

[a] Age break criteria: Kiefer et al. 1992.

APPENDIX C

Appendix C. Maps showing 1999 chinook salmon redd count transects and numbers of redds counted

LEGEND

Transect Boundaries

Ground Redd Counts

Helicopter Redd Counts

Road

Trail

Forest Service Station

Campground

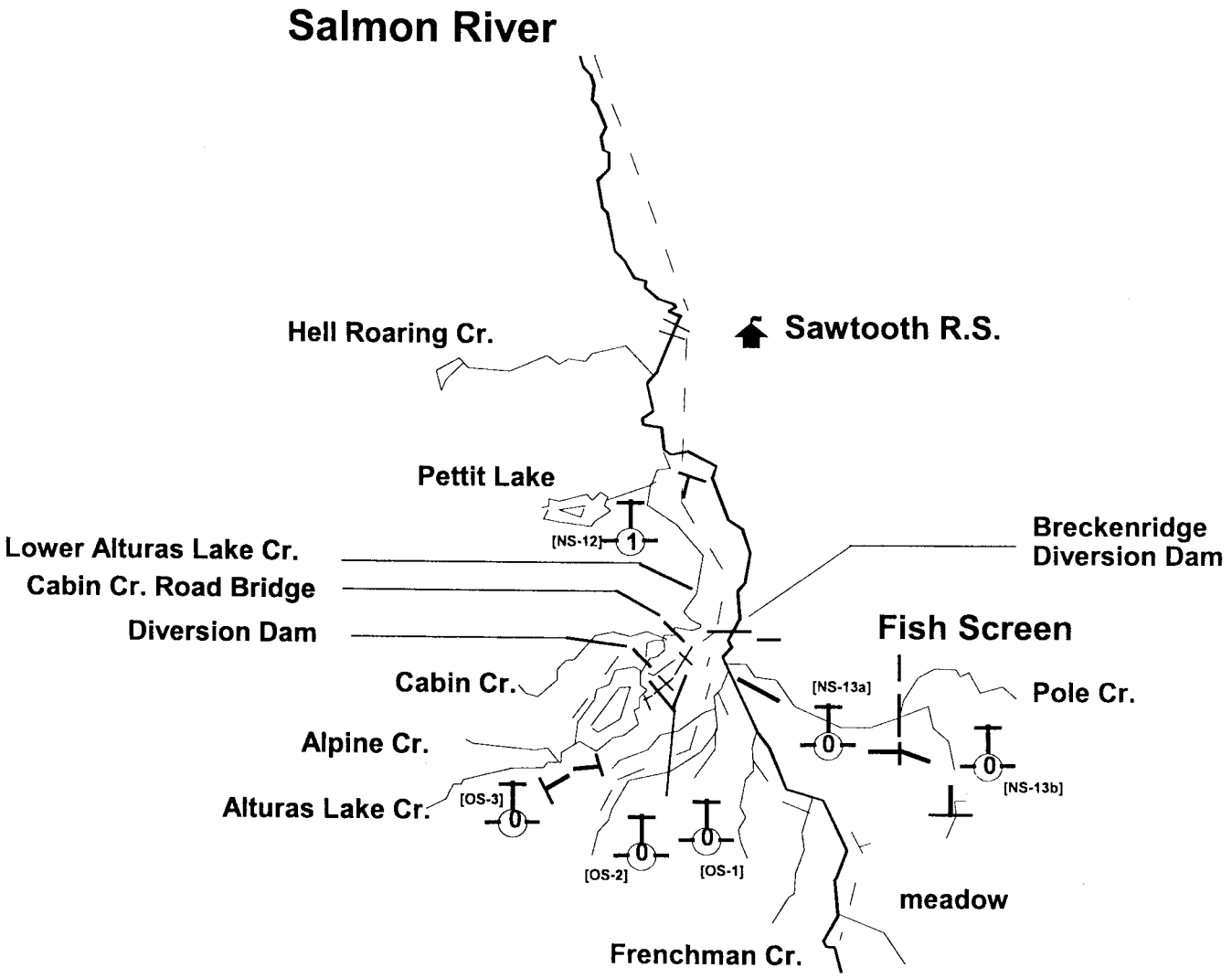
Road or Highway Bridge

Pack Bridge

Transect Codes (See Appendix B) **[WS-##], [NS-##], [WC-##], etc.**

DRAINAGE Salmon River
STREAM Alturas Lake Creek/Pole Creek
OBSERVATION CONDITIONS Poor/Moderate
TIMING Early On Time Late

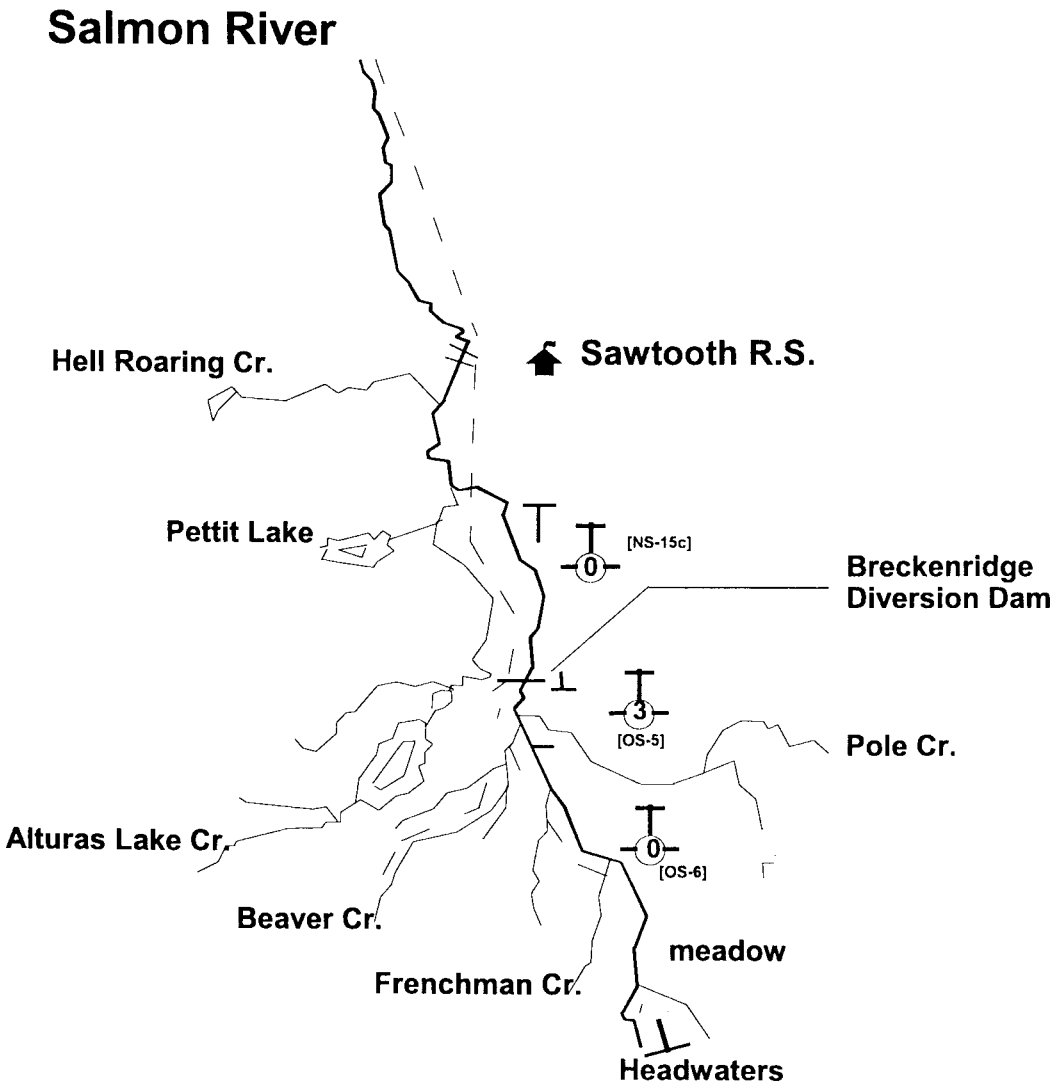
SURVEY DATE 9/2/99
MAP SCALE 0.78 cm = 1 mile
OBSERVER Curet & Larkin
REMARKS Helicopter



MAP-23

DRAINAGE Salmon River
STREAM Upper Salmon River
OBSERVATION CONDITIONS Poor/Moderate
TIMING Early On Time Late

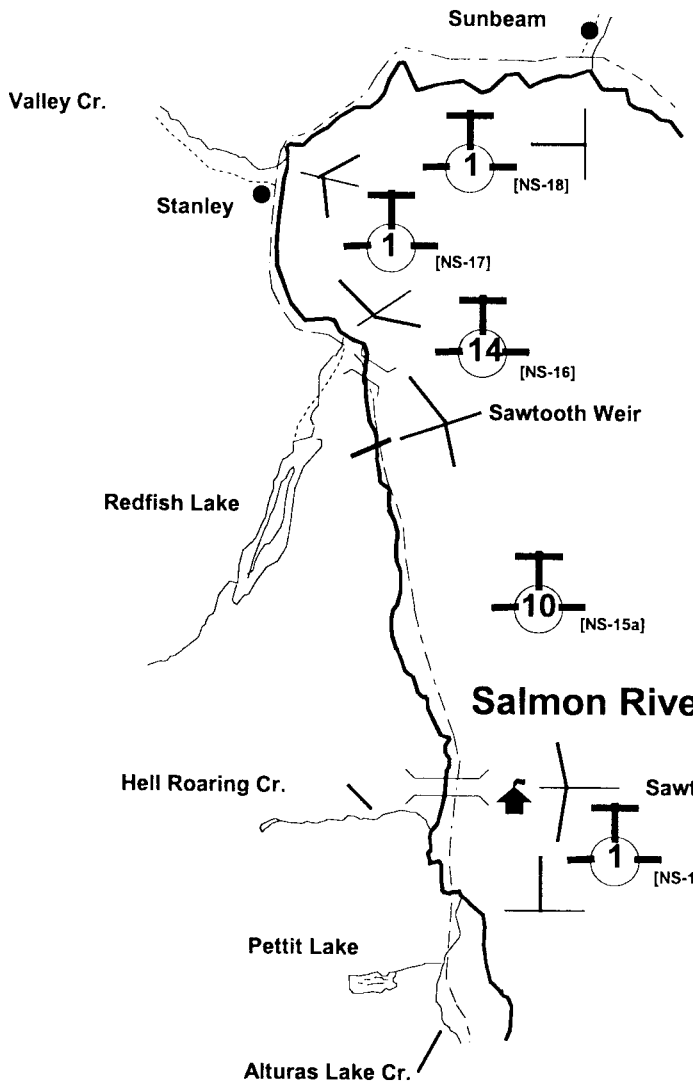
SURVEY DATE 9/2/99
MAP SCALE 0.78 cm = 1 mile
OBSERVER Curet & Larkin
REMARKS Helicopter



MAP-23

DRAINAGE Salmon River
STREAM Salmon River
OBSERVATION CONDITIONS Poor/Moderate
TIMING Early On Time Late

SURVEY DATE 9/2/99
MAP SCALE 0.78 cm = 1 mile
OBSERVER Curet & Larkin
REMARKS Helicopter



Number of Spring Chinook released above Sawtooth Weir:

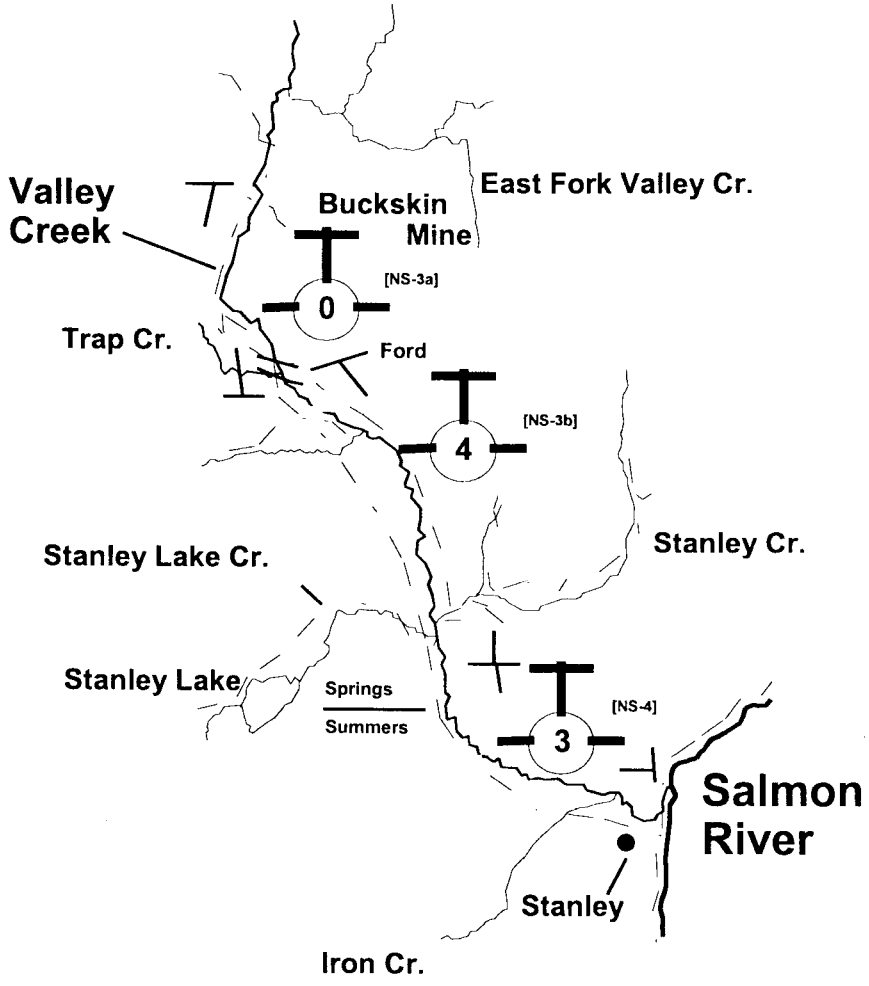
Males	54
Jacks	53
Females	22

Total Released:	129
Total Trap Count:	196

MAP-01

DRAINAGE Salmon River
STREAM Valley Creek
OBSERVATION CONDITIONS Poor/Moderate
TIMING Early On Time Late

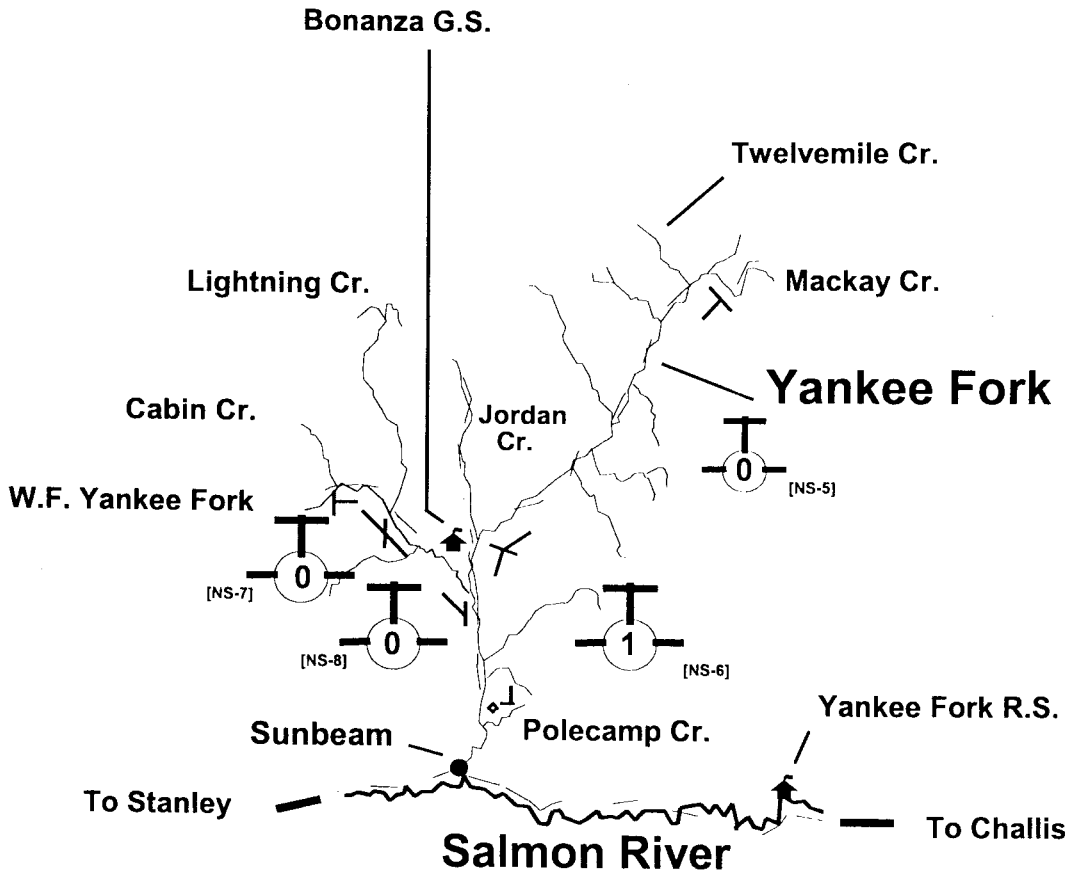
SURVEY DATE 9/2/99
MAP SCALE 1.6 cm = 1 mile
OBSERVER Curet & Larkin
REMARKS Helicopter



MAP-09

DRAINAGE Salmon River
STREAM Yankee Fork
OBSERVATION CONDITIONS Poor/Moderate
TIMING Early On Time Late

SURVEY DATE 9/2/99
MAP SCALE 0.70 cm = 1 mile
OBSERVER Curet & Larkin
REMARKS Helicopter

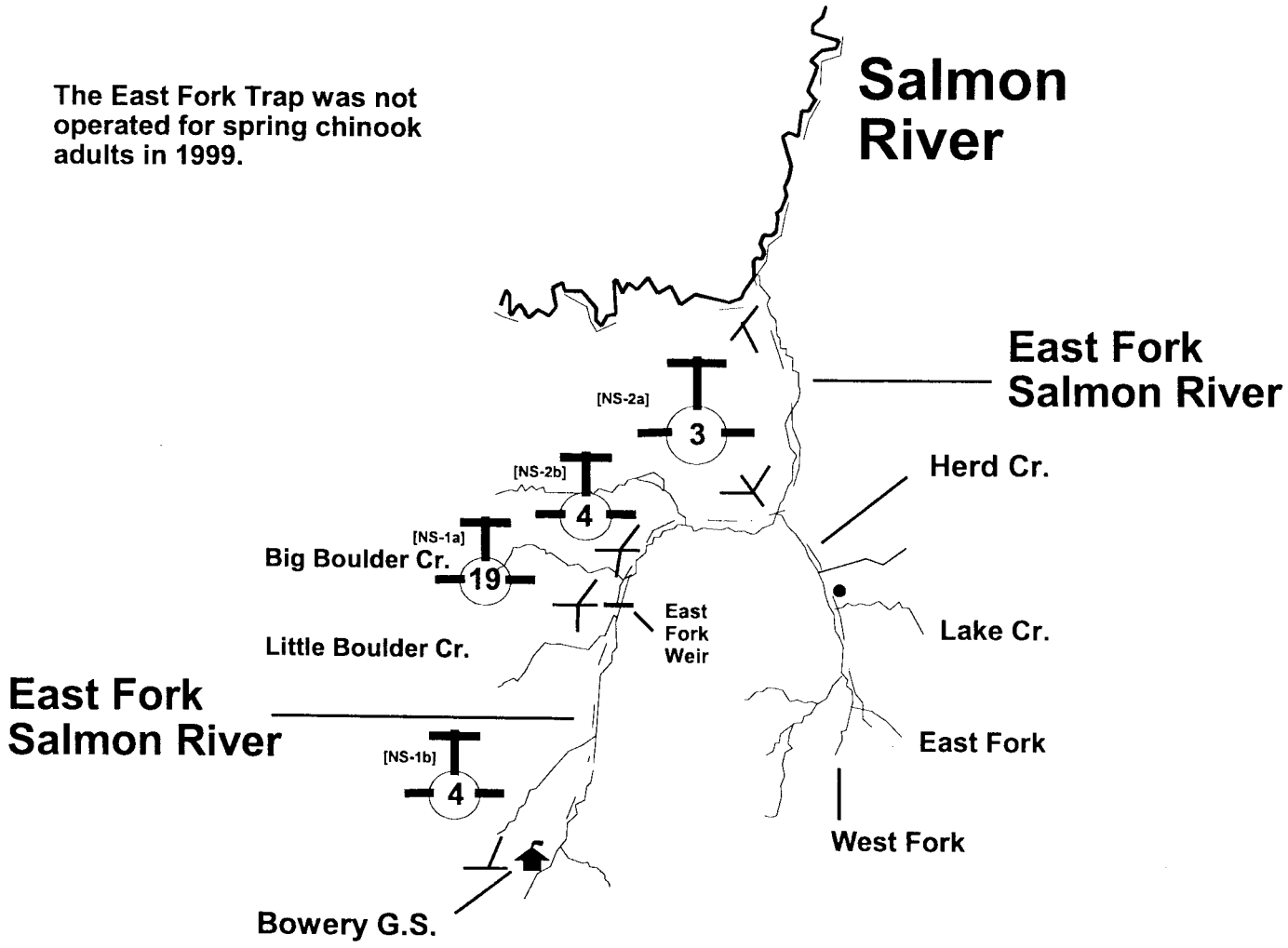


MAP-11

DRAINAGE Salmon River
STREAM East Fork Salmon River
OBSERVATION CONDITIONS Poor/Moderate
TIMING Early On Time Late

SURVEY DATE 9/2/99
MAP SCALE 0.6 cm 1 = mile
OBSERVER Curet & Larkin
REMARKS Helicopter

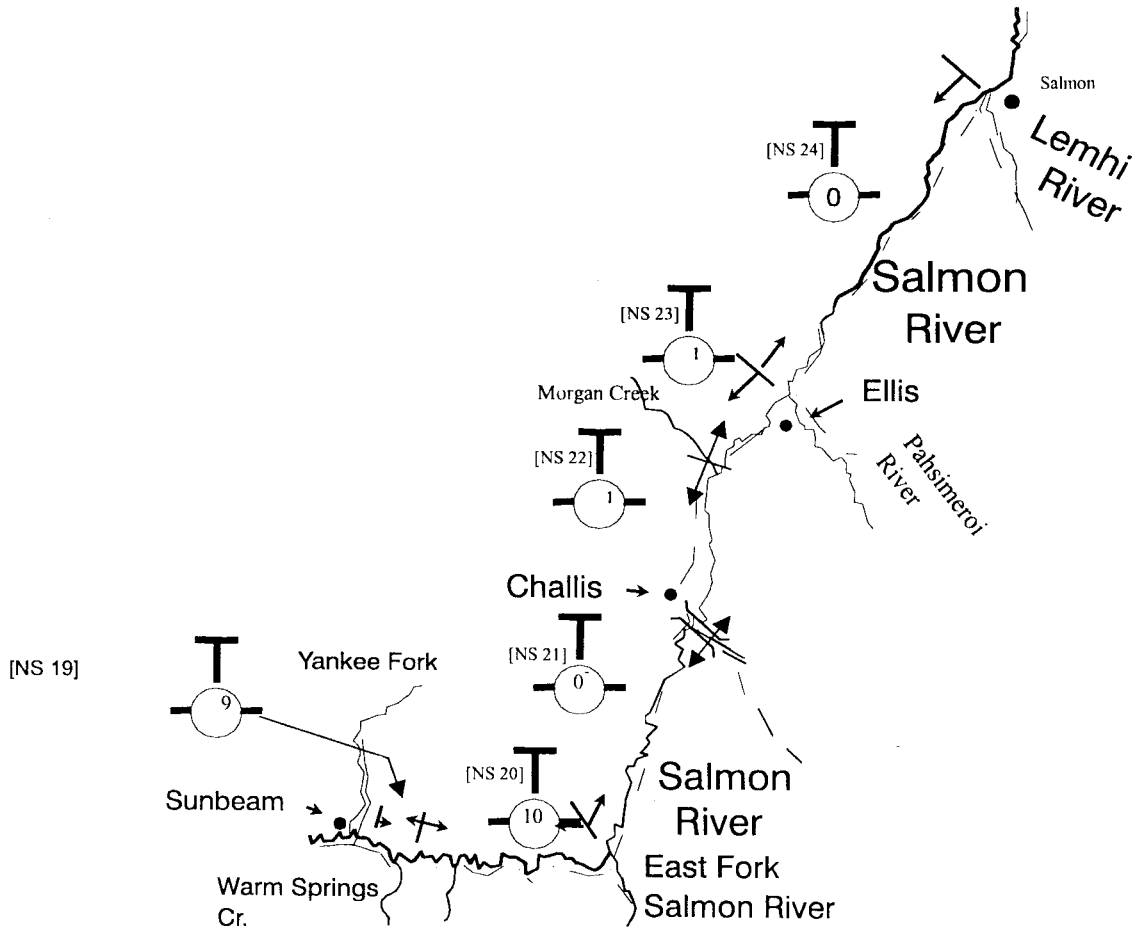
The East Fork Trap was not operated for spring chinook adults in 1999.



MAP-12

DRAINAGE Salmon River
STREAM Salmon River
OBSERVATION CONDITIONS Poor/Moderate
TIMING Early On Time Late

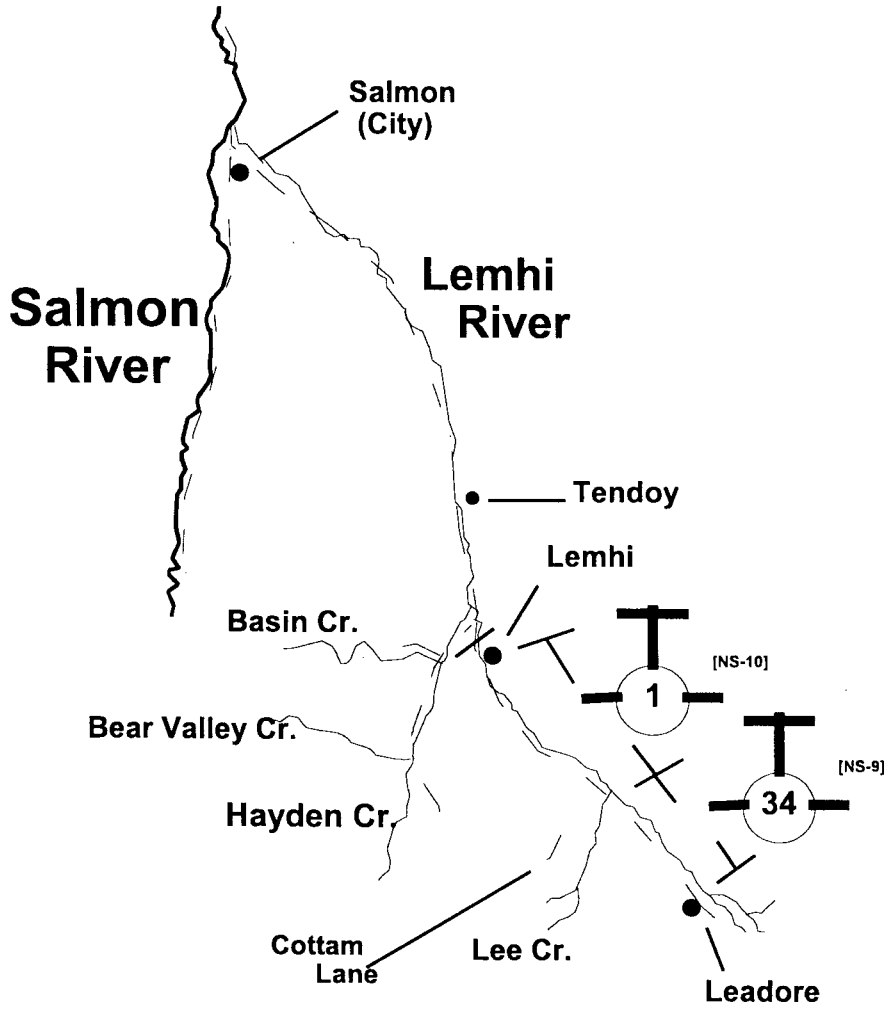
SURVEY DATE 9/2/99
MAP SCALE 0.35 cm = 1 mile
OBSERVER Curet & Larkin
REMARKS Helicopter



MAP-10

DRAINAGE Salmon River
STREAM Lemhi River
OBSERVATION CONDITIONS Poor/Moderate
TIMING Early On Time Late

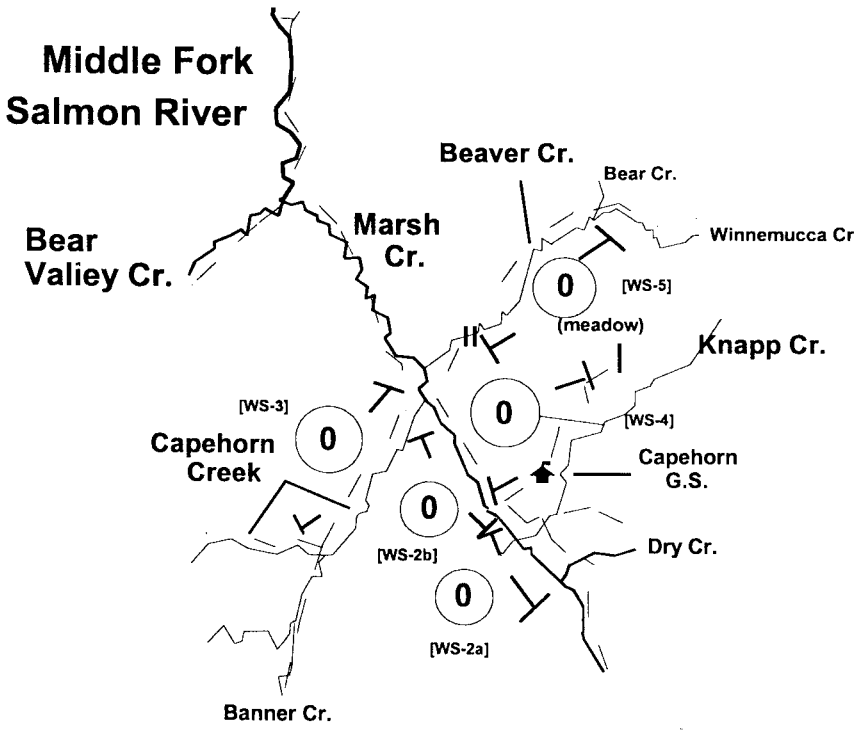
SURVEY DATE 9/3/99
MAP SCALE 0.40 cm = 1 mile
OBSERVER Curet & Larkin
REMARKS Helicopter



MAP-13

DRAINAGE Middle Fork Salmon River
STREAM Marsh, Beaver, Knapp, & Capehorn Creeks
OBSERVATION CONDITIONS Excellent
TIMING Early **On Time** Late

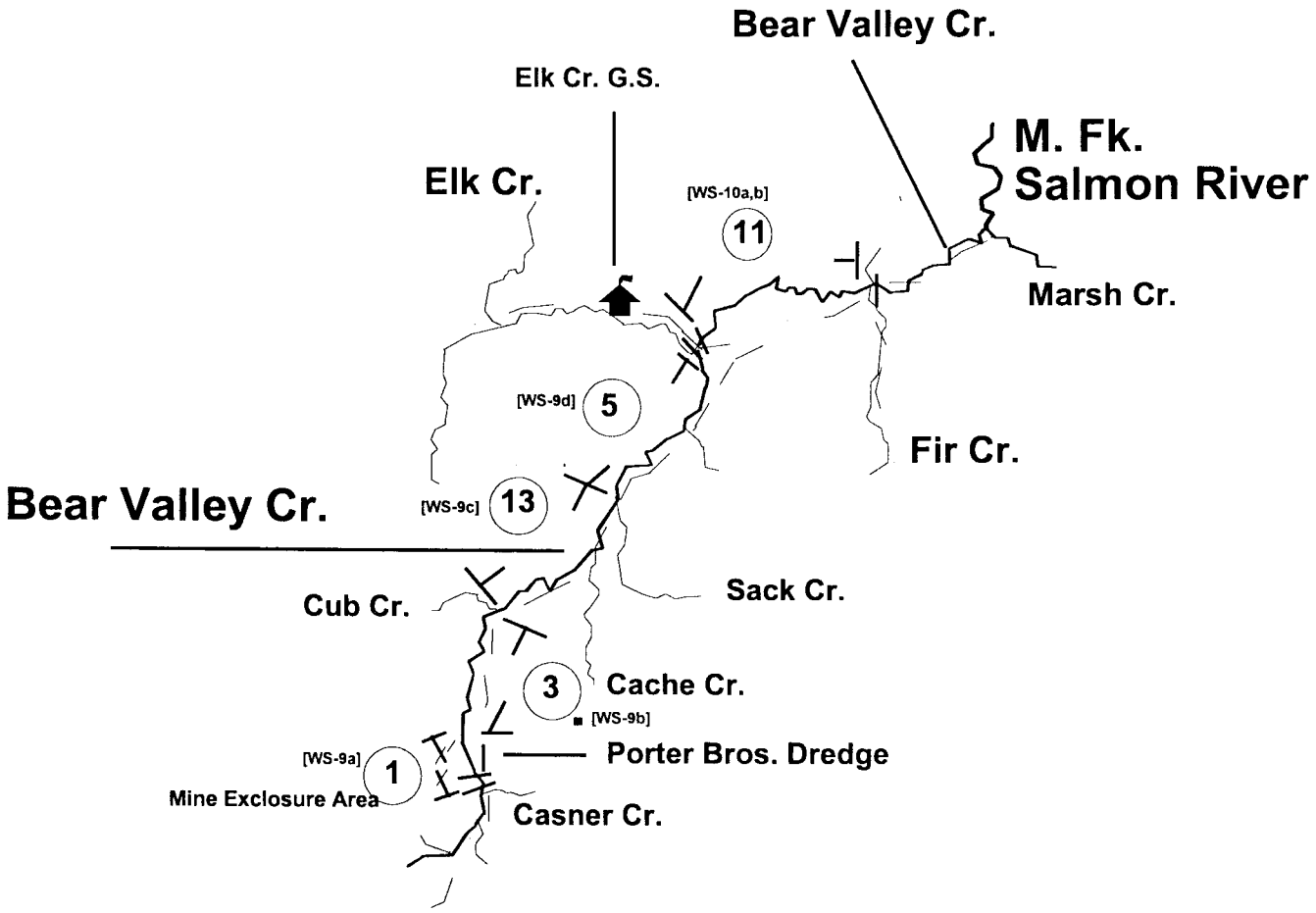
SURVEY DATE 8/12/99
MAP SCALE 1.15 cm = 1 mile
OBSERVER Curet & Larkin
REMARKS Ground



MAP-06

DRAINAGE Middle Fork Salmon River
STREAM Bear Valley Creek
OBSERVATION CONDITIONS Good
TIMING Early On Time Late

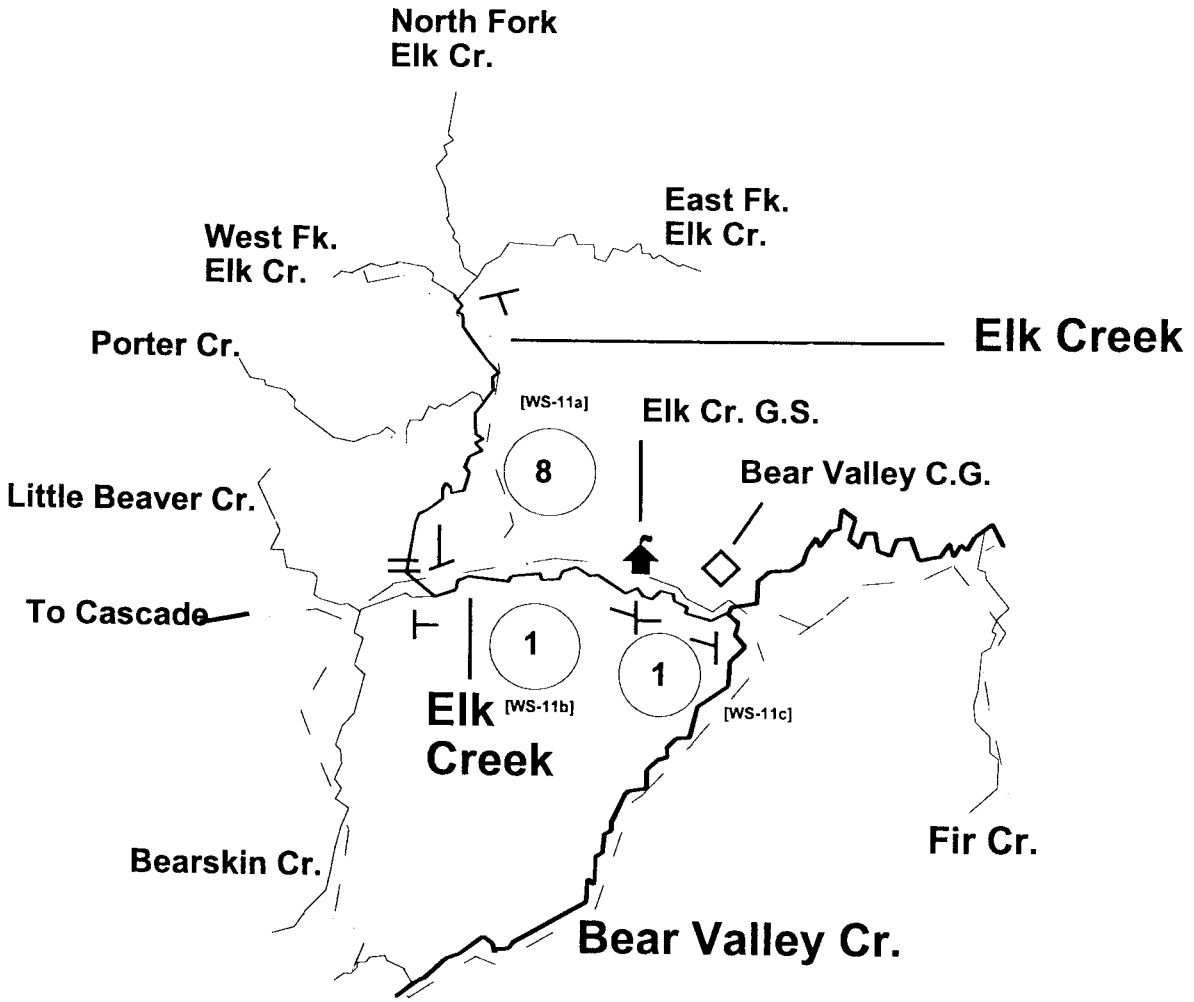
SURVEY DATE 8/23, 24, 25/99
MAP SCALE 0.90 cm = 1 mile
OBSERVER Yundt
REMARKS Ground



MAP-20

DRAINAGE Middle Fork Salmon River
STREAM Elk Creek
OBSERVATION CONDITIONS Good
TIMING Early On Time Late

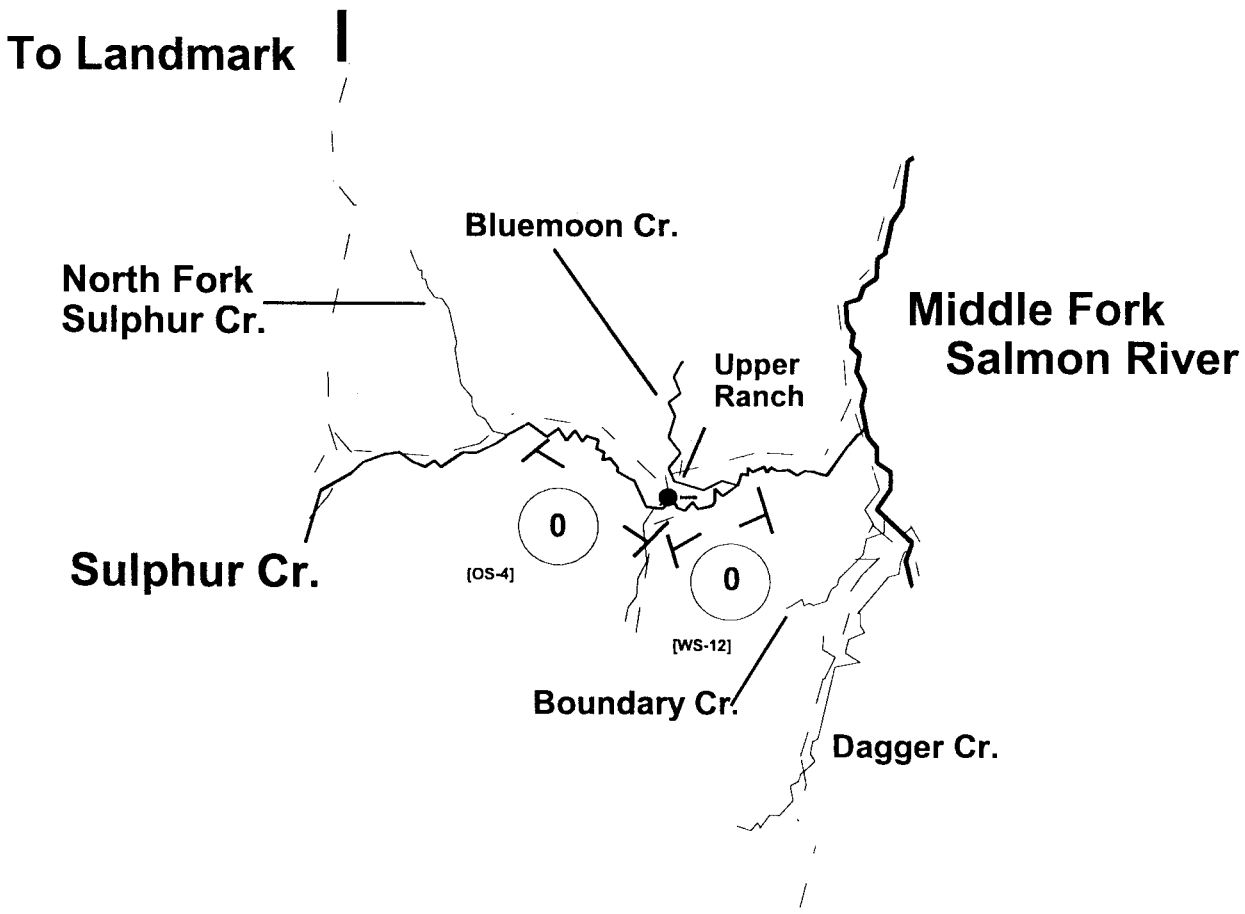
SURVEY DATE 8/24/99 & 8/26/99
MAP SCALE 1.3 cm = 1 mile
OBSERVER Yundt
REMARKS Ground



MAP-22

DRAINAGE Middle Fork Salmon River
STREAM Sulphur Creek
OBSERVATION CONDITIONS Good
TIMING Early On Time Late

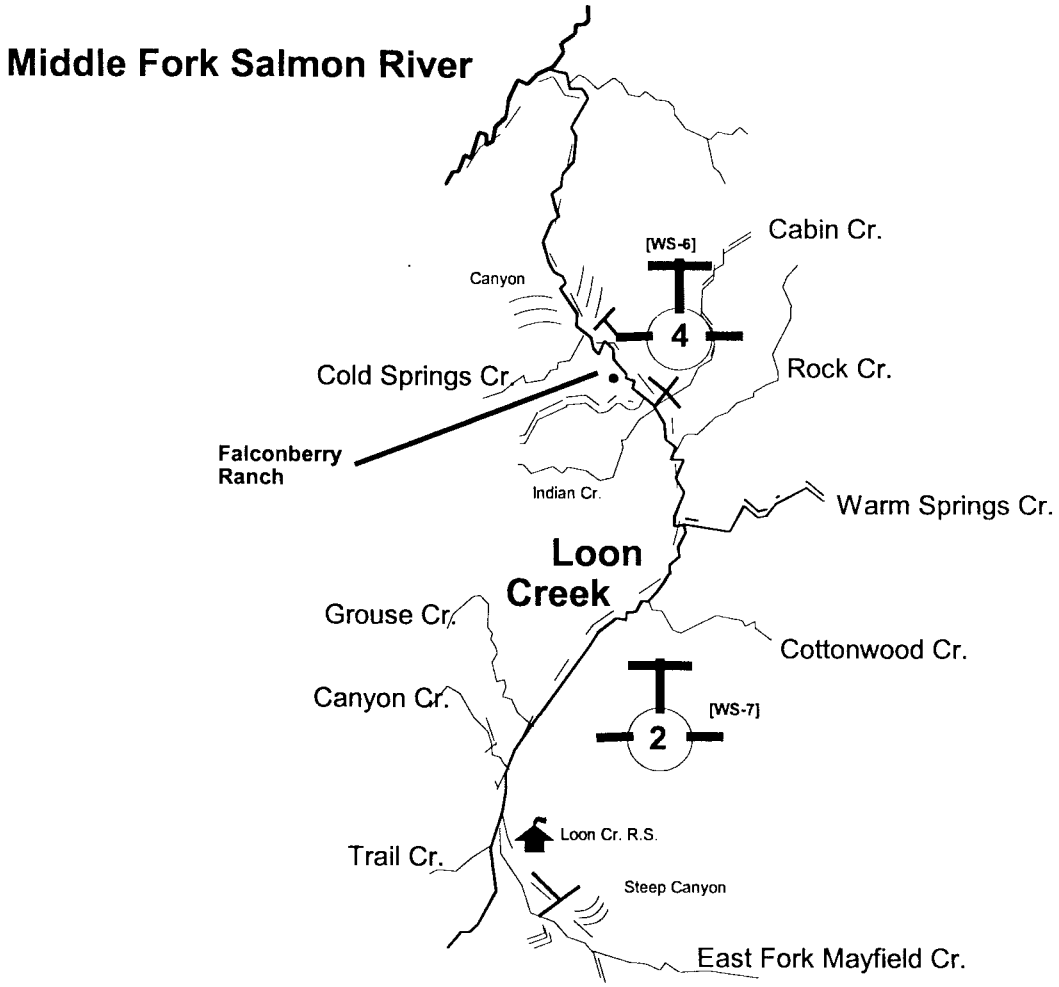
SURVEY DATE 8/24/99
MAP SCALE 1.3 cm = 1 mile
OBSERVER Yundt
REMARKS Ground



MAP-07

DRAINAGE Middle Fork Salmon River
STREAM Loon Creek
OBSERVATION CONDITIONS Poor/Moderate
TIMING Early On Time Late

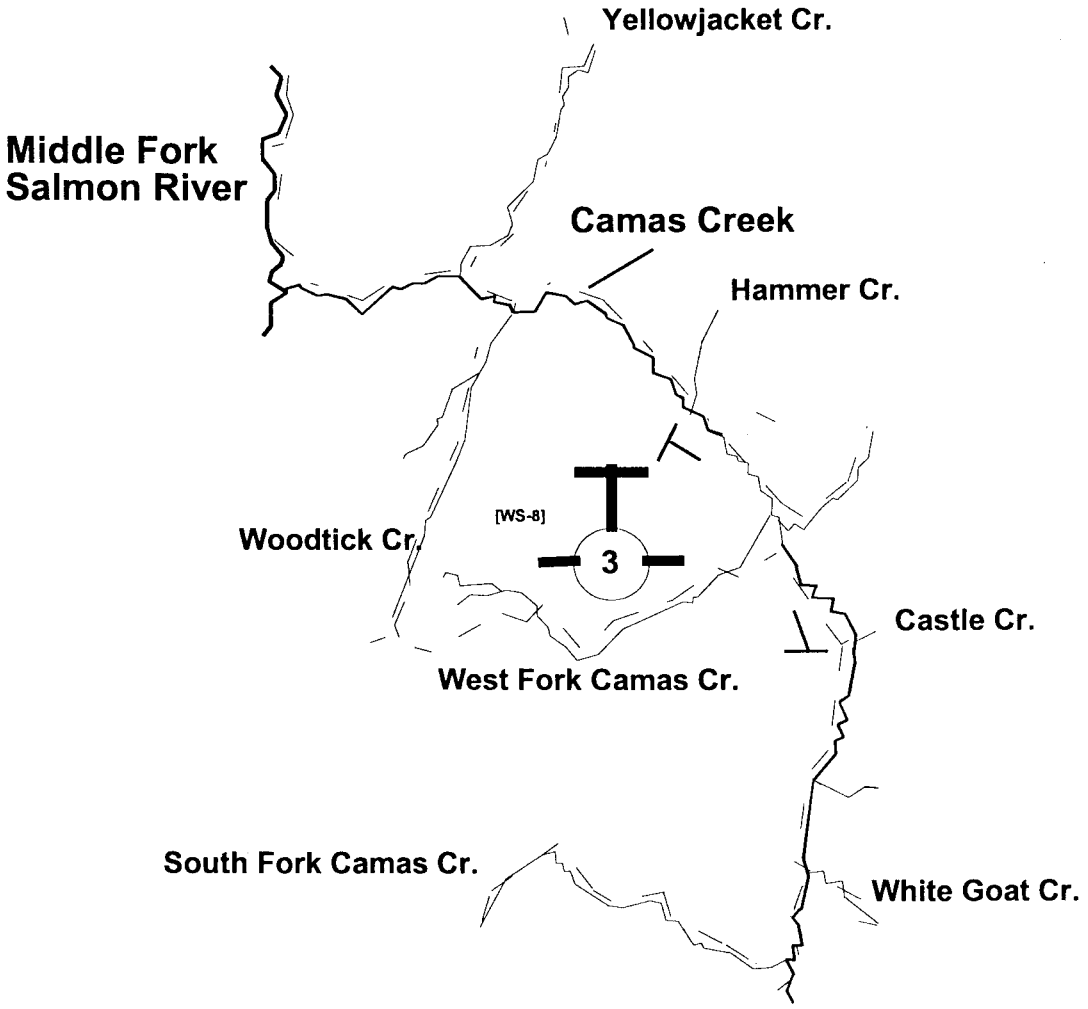
SURVEY DATE 9/2/99
MAP SCALE 0.85 cm =1 mile
OBSERVER Curet & Larkin
REMARKS Helicopter



MAP-02

DRAINAGE Middle Fork Salmon River
STREAM Camas Creek
OBSERVATION CONDITIONS Poor/Moderate
TIMING Early On Time Late

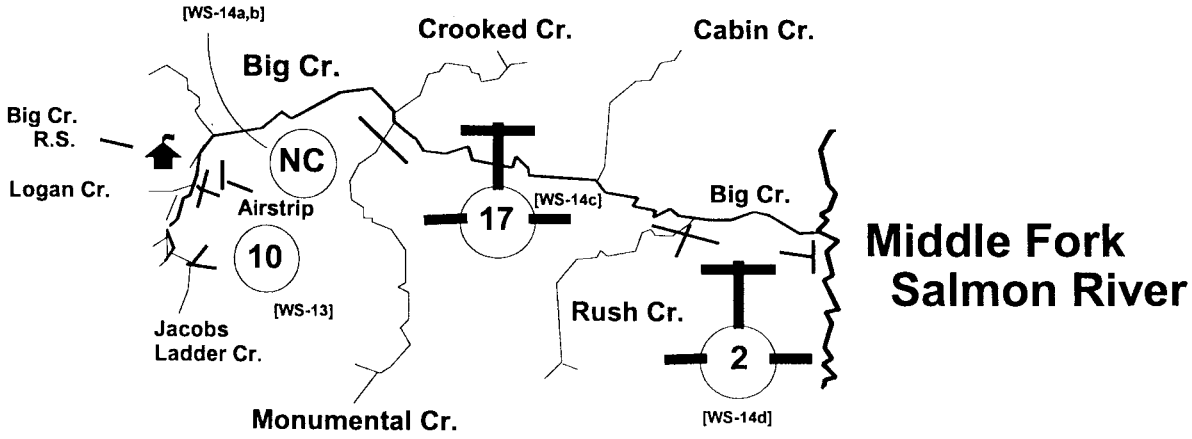
SURVEY DATE 9/3/99
MAP SCALE 1.10 cm = 1 mile
OBSERVER Curet & Larkin
REMARKS Helicopter



MAP-08

DRAINAGE Middle Fork Salmon River
STREAM Big Creek
OBSERVATION CONDITIONS Poor/Moderate
TIMING Early On Time Late

SURVEY DATE 8/24/99, 9/3/99
MAP SCALE 0.45 cm = 1 mile
OBSERVER Anderson & Apperson
REMARKS Ground, Helicopter

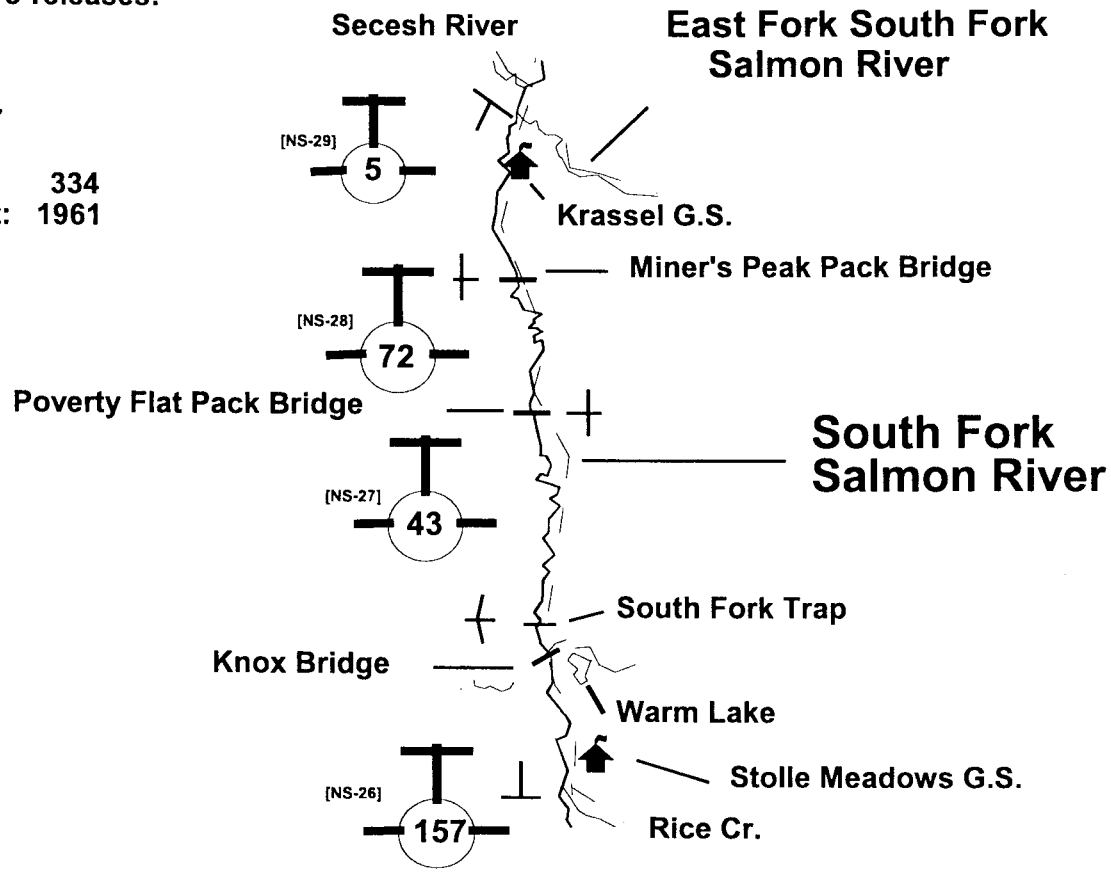


DRAINAGE Salmon River
STREAM South Fork Salmon River
OBSERVATION CONDITIONS Poor
TIMING Early On Time Late

SURVEY DATE 8/26/99, 9/7/99
MAP SCALE 0.40 cm = 1 mile
OBSERVER Apperson & Anderson
REMARKS Helicopter

Number of Chinook Salmon released from South Fork Salmon Trap; excluding re-releases:

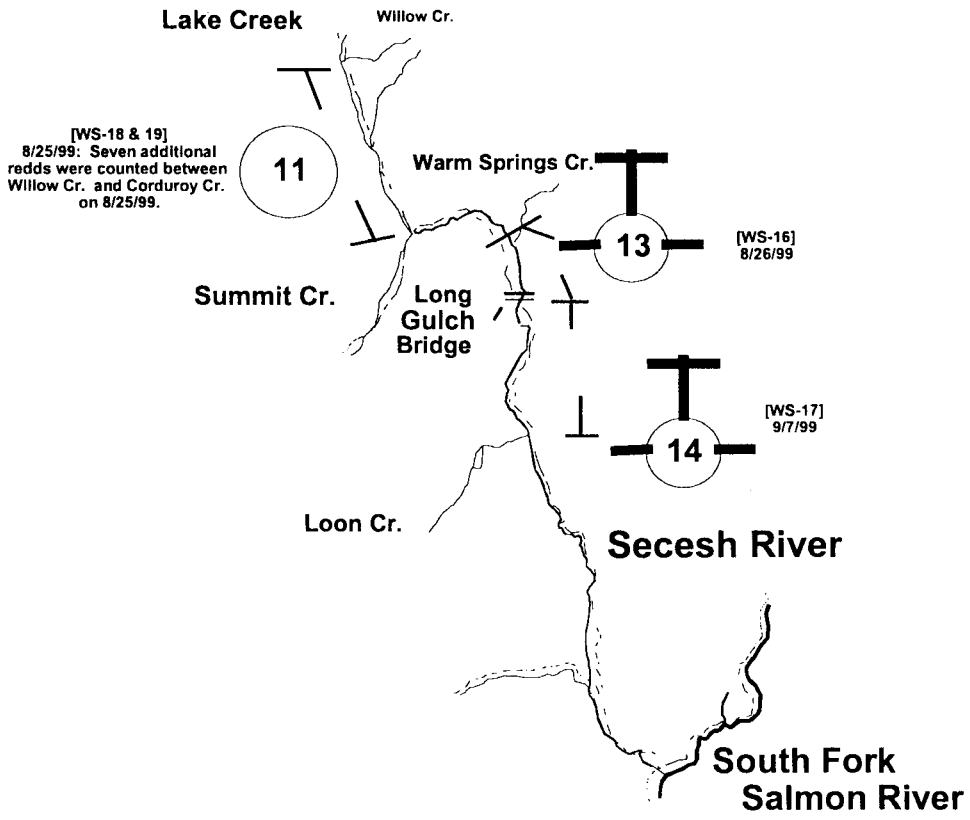
Males	165
Females	132
Jacks	37
Total Released:	334
Total Trap Count:	1961



MAP-21

DRAINAGE South Fork Salmon River
STREAM Lake Creek - Secesh River
OBSERVATION CONDITIONS Good
TIMING Early On Time Late

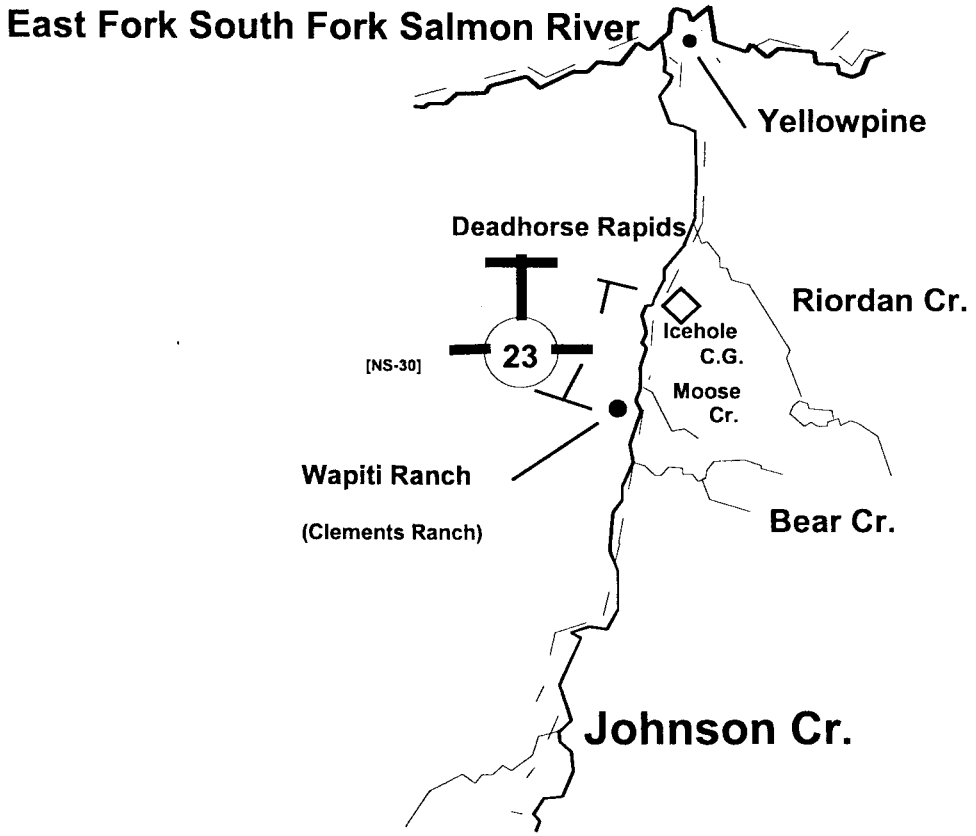
SURVEY DATE 8/25/99, 8/26/99, 9/7/99
MAP SCALE 0.65 cm = 1 mile
OBSERVER Anderson & Apperson
REMARKS Ground - Helicopter



MAP-03

DRAINAGE E. Fk. of South Fork Salmon
STREAM Johnson Creek
OBSERVATION CONDITIONS Good
TIMING Early **On Time** Late

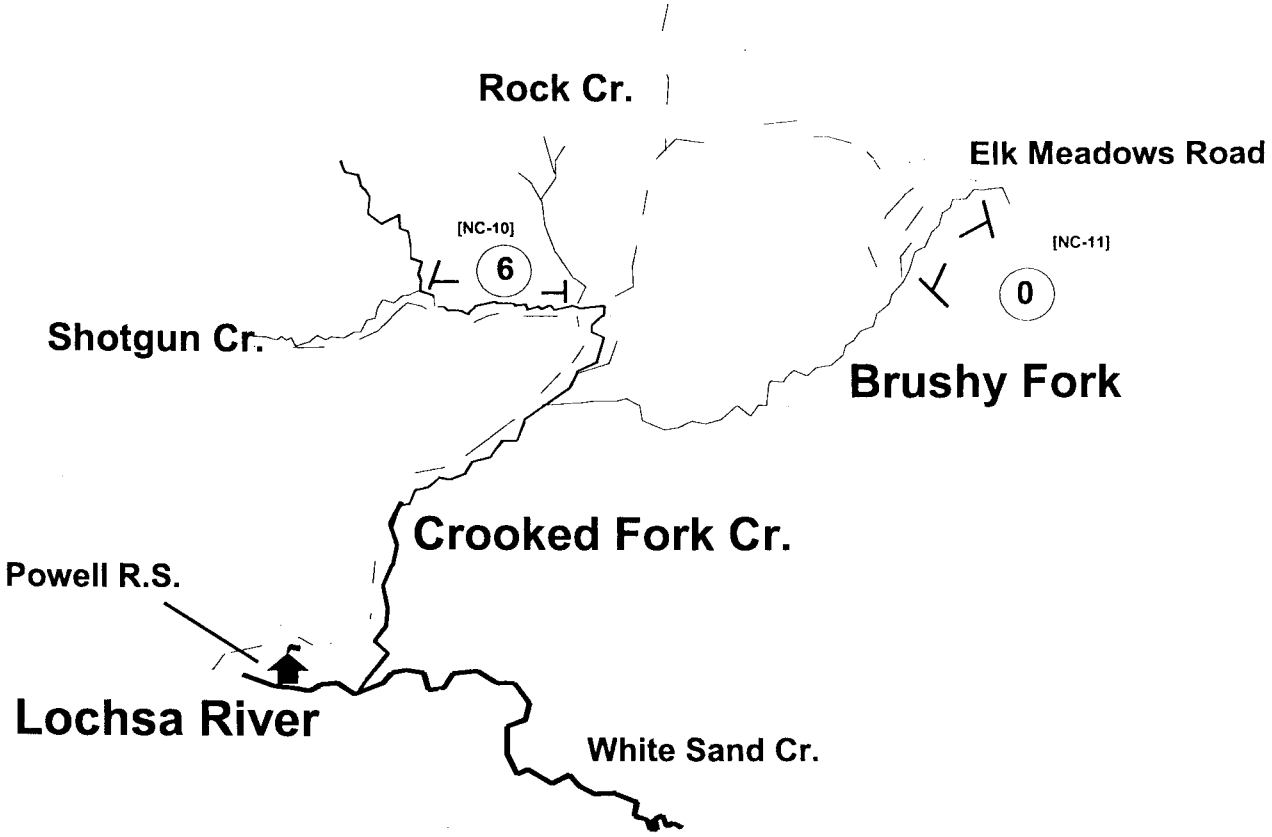
SURVEY DATE 8/26/99
MAP SCALE 0.95 cm = 1 mile
OBSERVER Anderson & Apperson
REMARKS Helicopter



MAP-04

DRAINAGE Clearwater River
STREAM Crooked Fork & Brushy Fork
OBSERVATION CONDITIONS Excellent
TIMING Early On Time Late

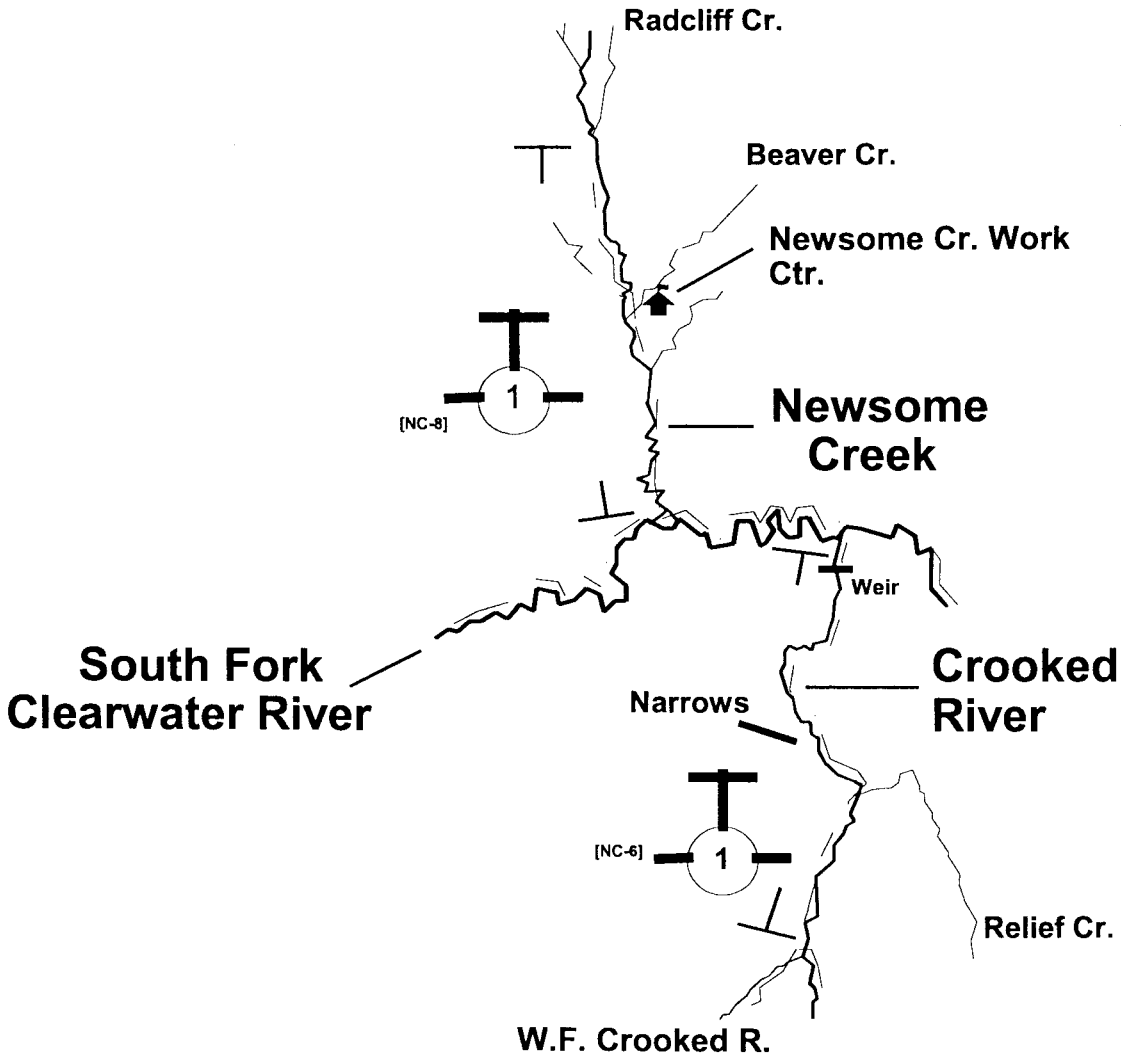
SURVEY DATE 9/2/99 & 9/3/99
MAP SCALE 0.95 cm = 1 mile
OBSERVER Brostom
REMARKS Ground



MAP-19

DRAINAGE Clearwater River
STREAM Crooked River & Newsome Creek
OBSERVATION CONDITIONS Excellent
TIMING Early On Time Late

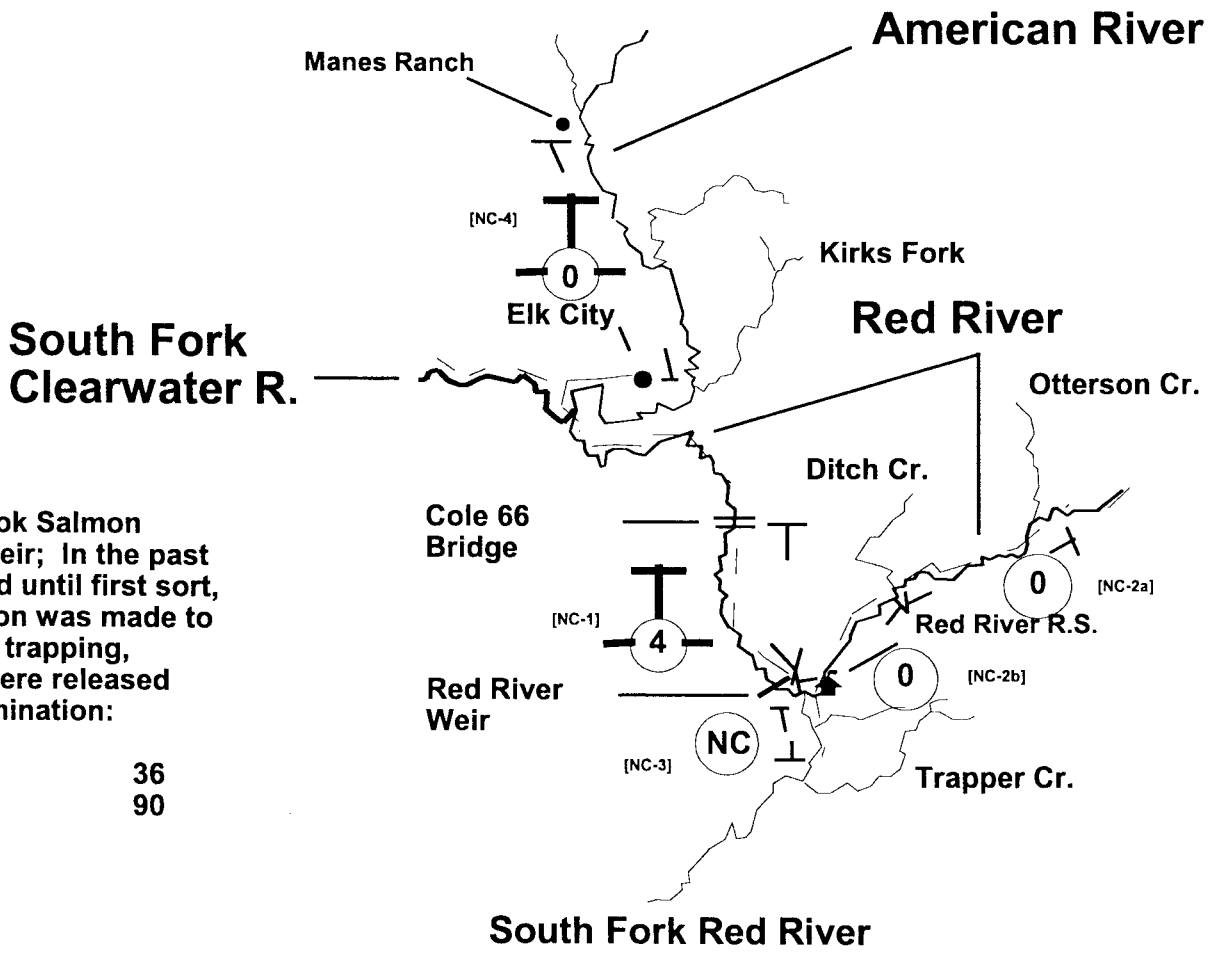
SURVEY DATE 8/31/99
MAP SCALE 0.85 cm = 1 mile
OBSERVER Brostrom
REMARKS Helicopter



MAP-15

DRAINAGE Clearwater River
STREAM Red R. and American River
OBSERVATION CONDITIONS Excellent
TIMING Early On Time Late

SURVEY DATE 8/31/99, 9/2/99, 9/3/99
MAP SCALE 0.75 cm = 1 mile
OBSERVER Brostrom
REMARKS Helicopter - Ground



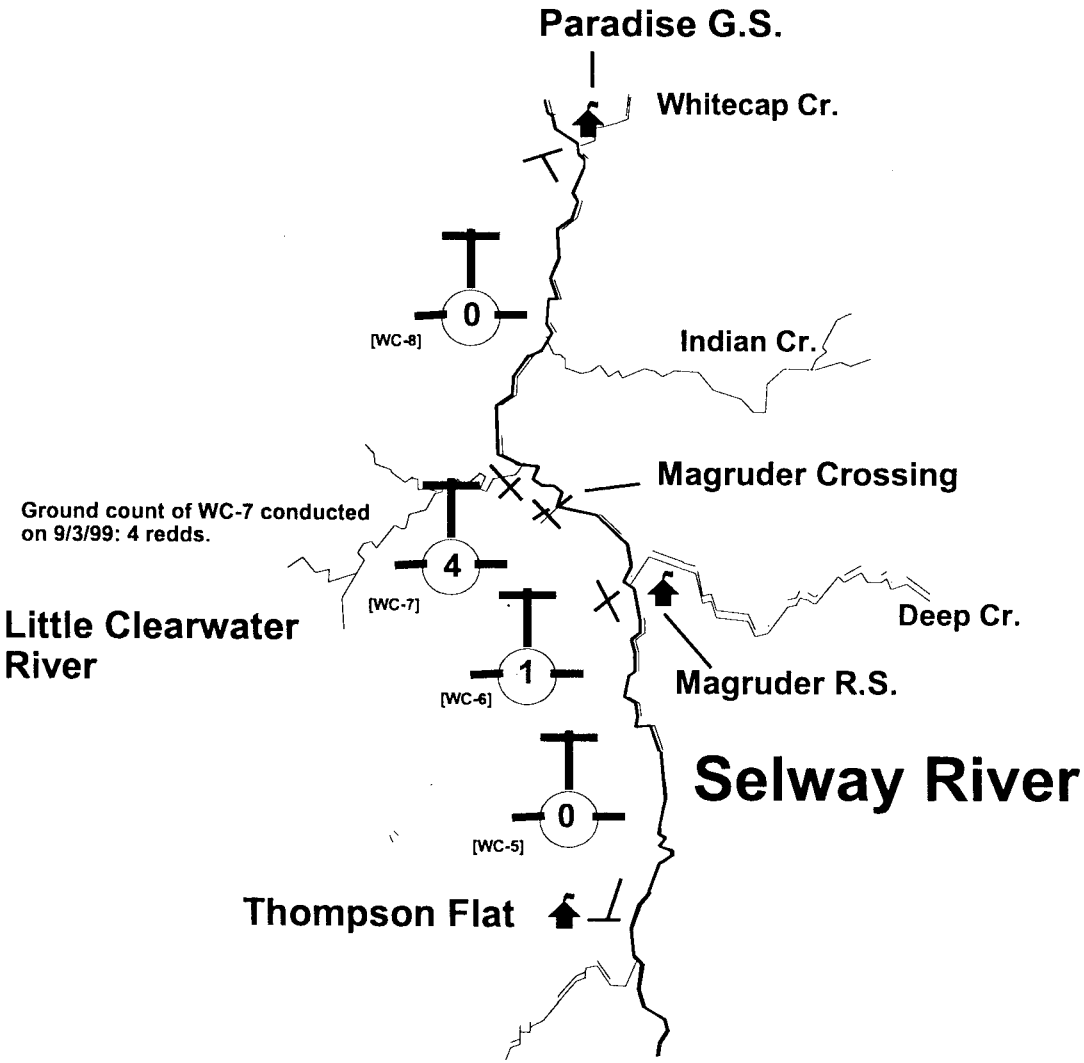
Number of Chinook Salmon released above weir; In the past chinook were held until first sort, this year a decision was made to release at time of trapping, therefore many were released before sex determination:

Total Released:	36
Total Trap Count:	90

MAP-16

DRAINAGE Clearwater River
STREAM Upper Selway River
OBSERVATION CONDITIONS Cloudy
TIMING Early On Time Late

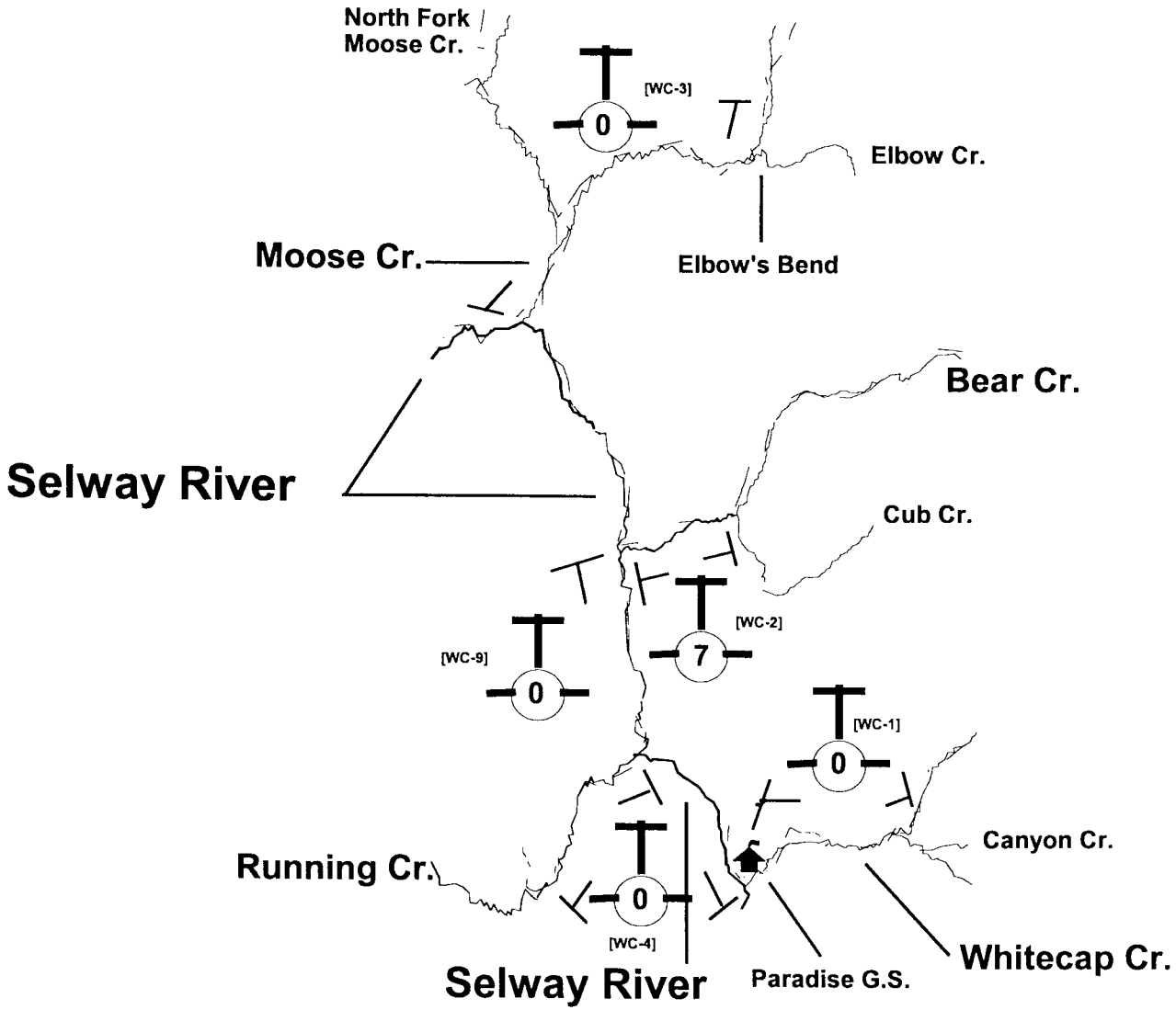
SURVEY DATE 9/15/99
MAP SCALE 0.85 cm = 1 mile
OBSERVER Brostrom
REMARKS Helicopter - Ground



MAP-17

DRAINAGE Clearwater River
STREAM Selway River & tributaries
OBSERVATION CONDITIONS Cloudy
TIMING Early On Time Late

SURVEY DATE 9/15/99
MAP SCALE 0.65 cm = 1 mile
OBSERVER Brostrom
REMARKS Helicopter



MAP-18

Submitted by:

Terry J. Elms-Cockrum
Senior Fishery Technician

Approved by:

Virgil K. Moore, Chief
Fisheries Bureau

Sharon W. Kiefer
Anadromous Fishery Manager